NASA

UAG-C 40

NASA CR71161

HIGH LATITUDE GEOPHYSICAL DATA

30 Mc/s COSMIC NOISE RECORDS — APR-JUNE, 1965

N-S TELLURIC CURRENT RECORDS — APR-JUNE, 1965

N-S TELLURIC AMPLITUDE ACTIVITY — APR-JUNE, 1965

TELLURIC FLUCTUATION ACTIVITY — APR-JUNE, 1965

TELLURIC MICROPULSATION ACTIVITY, pc 1 — APR-JUNE, 1965

GEOMAGNETIC ACTIVITY, K, Ak, C — APR-JUNE, 1965

GPO PRICE $ _____

CFSTI PRICE(S) $ _____

Hard copy (HC) 3.00

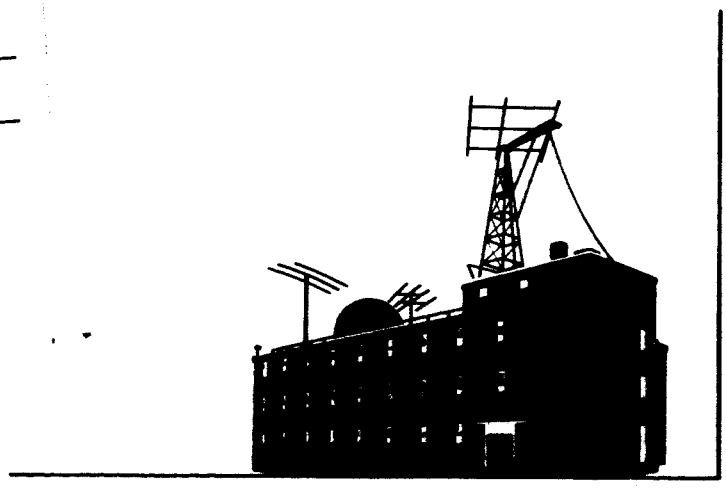
Microfiche (MF) .75

ff 653 July 65

JUNE, 1965

GEOPHYSICAL INSTITUTE
UNIVERSITY OF ALASKA

COLLEGE, ALASKA



"High Latitude Geophysical Data" is published by the Institute with the objective of presenting current geophysical data related to polar ionospheric activity. Because of the research nature of the Institute's program, the type of material presented and the experimental and scaling methods may be novel and are subject to change. Thus the methods are described in sufficient detail to assure correct interpretation of data.

V. P. Hessler, Editor

30 MC/S COSMIC NOISE LEVEL

R. Parthasarathy
Assoc. Professor of Physics

and

J. L. Hook
Sr. Research Assistant

This section consists of reproductions of the cosmic radio noise level at 30 Mc/s, monitored at College, Alaska (64.65°N, 256.56°E, geomagnetic).

The zenith directed antenna is a pair of crossed, 3-element Yagis, responding to the noise in the right circular mode. The beam has approximate rotational symmetry, with about 60 degrees between half-power points. The power linear receiver system is calibrated daily by a noise diode, in steps of 0, 2.0, 4.0, and 6.0 milliamps of the diode plate current.

The variation of the noise level at College is primarily due to the variation of the precipitating auroral particles. It is known that the energies of these primary particles (electrons and protons) that are of immediate relevance to the luminosity of the auroral displays are about a few kilovolts, and that the integral energy spectrum of the flux expressed as a power law of the energy is characterized by an exponent, minus γ , the γ varying from about two to five. It is also known from observations at 37 Mc/s with antenna beams comparable to the angular dimensions of the displays (i.e., a few degrees in the meridian plane) that, in general, the radiowave absorption in any direction is only poorly specified by the luminosity of the display. The radiowave absorption at a single frequency is not capable of specifying the height distribution of ionization responsible for the absorption, and hence the energies of the primary particles. Simultaneous absorption data in a number of frequencies in the HF and VHF band have, therefore, been utilized in the past for deriving the ionization profile as a function of height over College. The derived profiles are compatible with the primary particle energies a few orders higher than the energies essentially responsible for the luminosity of the aurora.

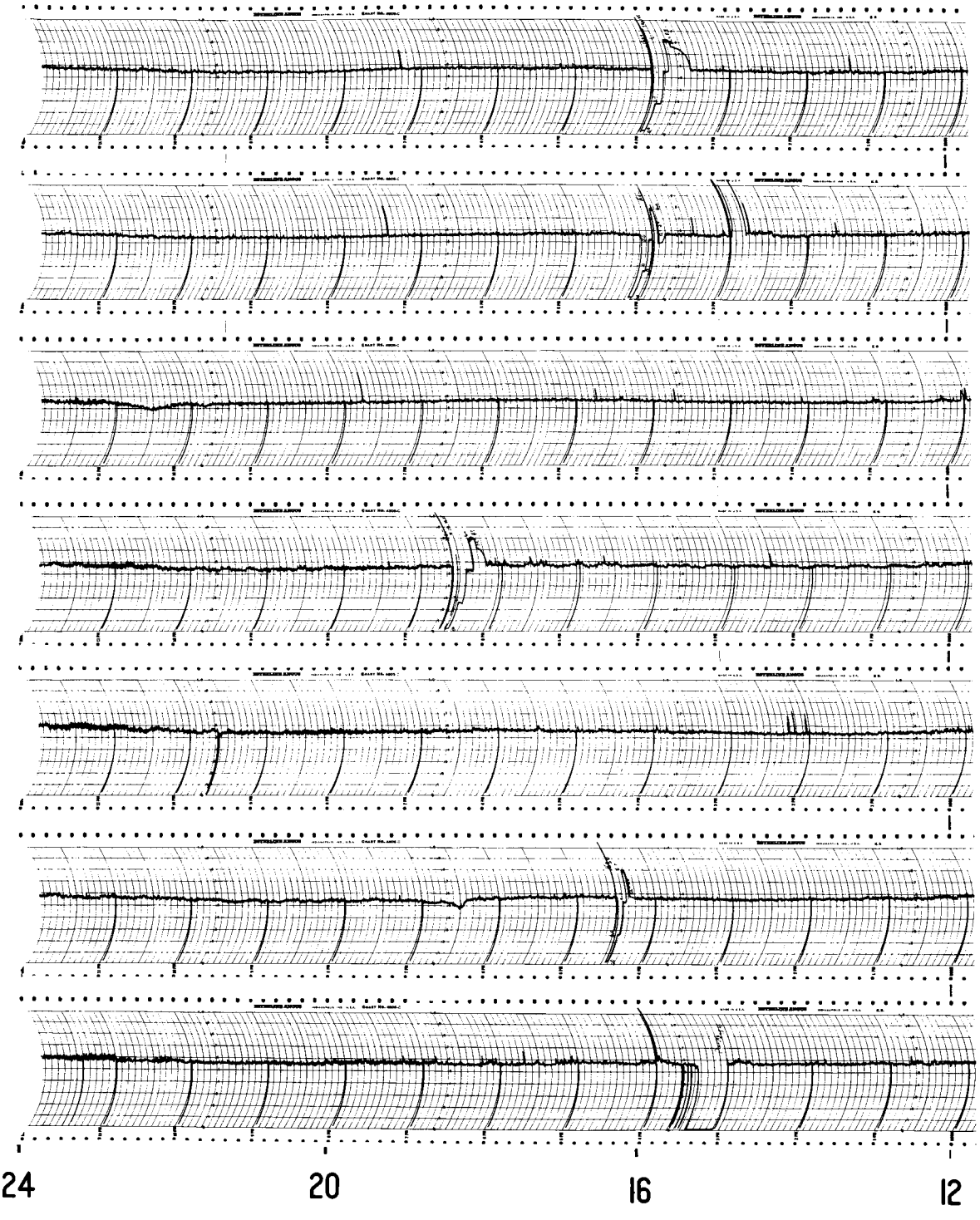
In seeking the relationship between the radiowave absorption and the outer radiation belt by means of the College data at 30 Mc/s, it may be cautioned that the station is known to be associated with the magnetic field line which defines the outer region, rather than the maximum-flux region, of the radiation belt; further, the rapid variability in the absorption as well as the typical localization in latitude, would require a very detailed knowledge of the flux distribution in the radiation belt, in time and space, before meaningful comparisons could be made. The problem is, however, less difficult in the case of the polar cap events, because of the spatial and temporal near-uniformity of absorption in the polar region.

It is thought that this publication may contribute to a somewhat greater understanding of the inter-relationship between the solar, magnetospheric and auroral phenomena than have been possible by means of the many decades of magnetic data.

The recording and reproduction of these traces is financially supported by the National Aeronautics and Space Administration under Contract NAS5-3595.

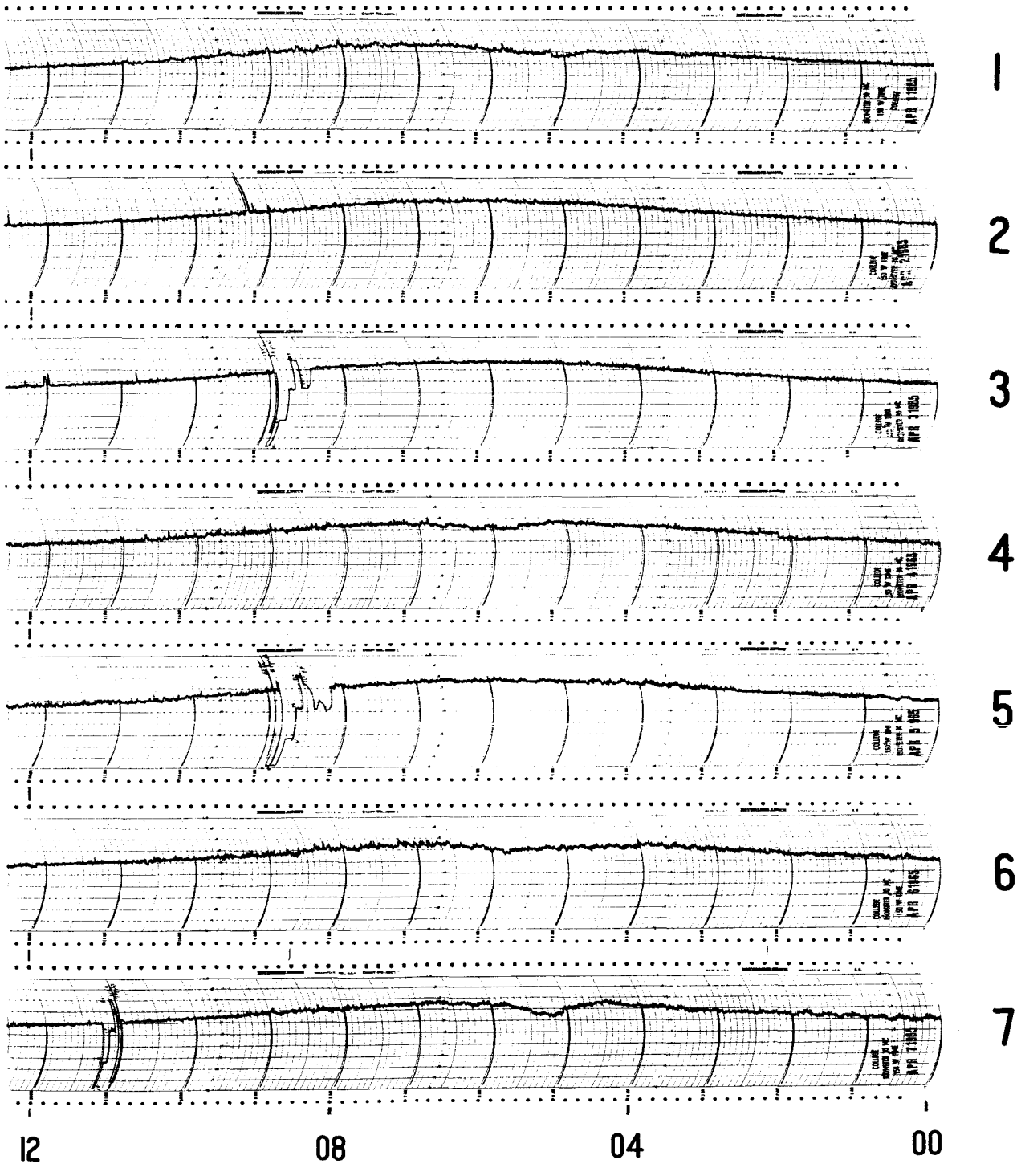
30 MC/S COSMIC NOISE

APR 1965 COLLEGE 12



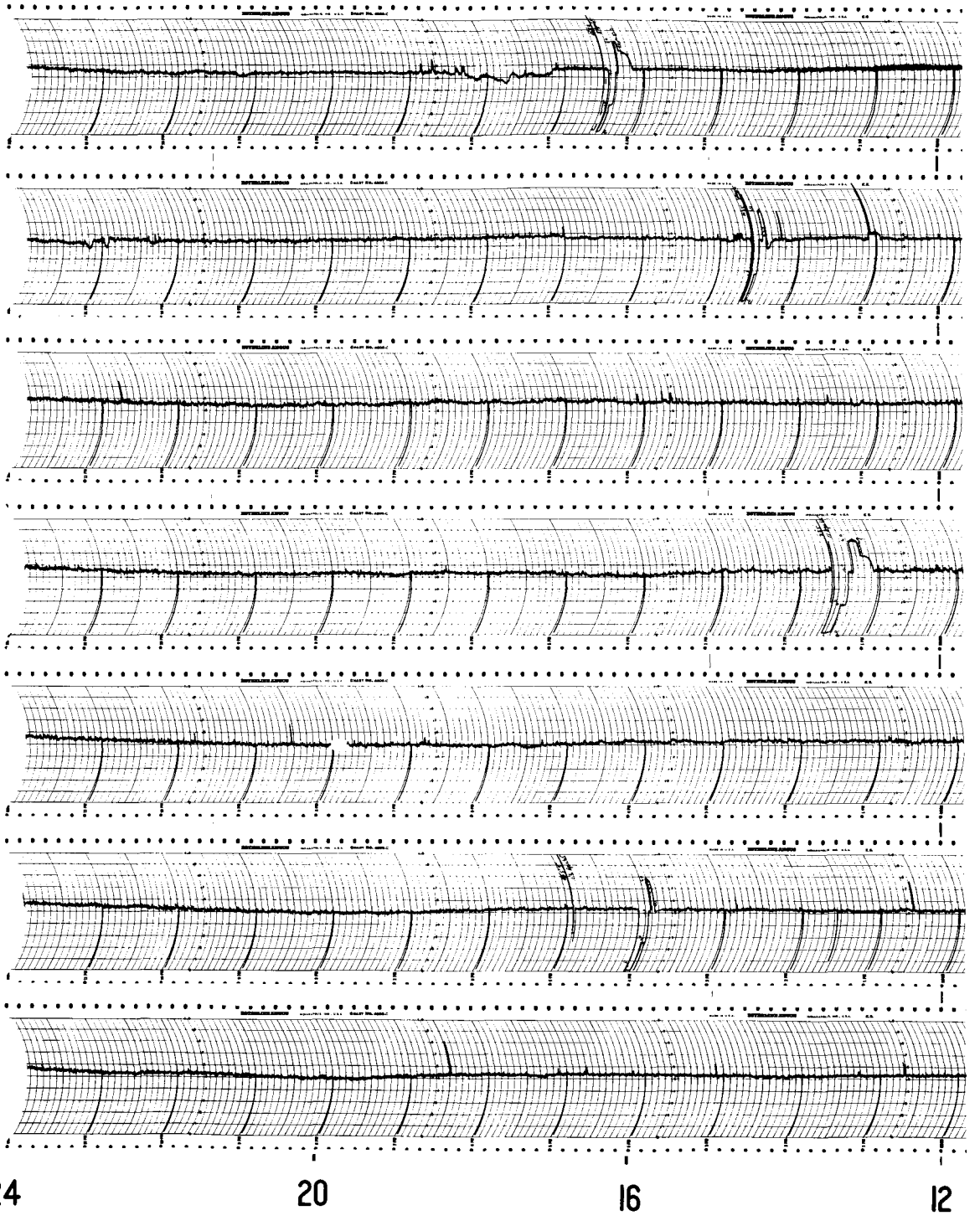
150° WEST MERIDIAN TIME

12 ALASKA APR 1965



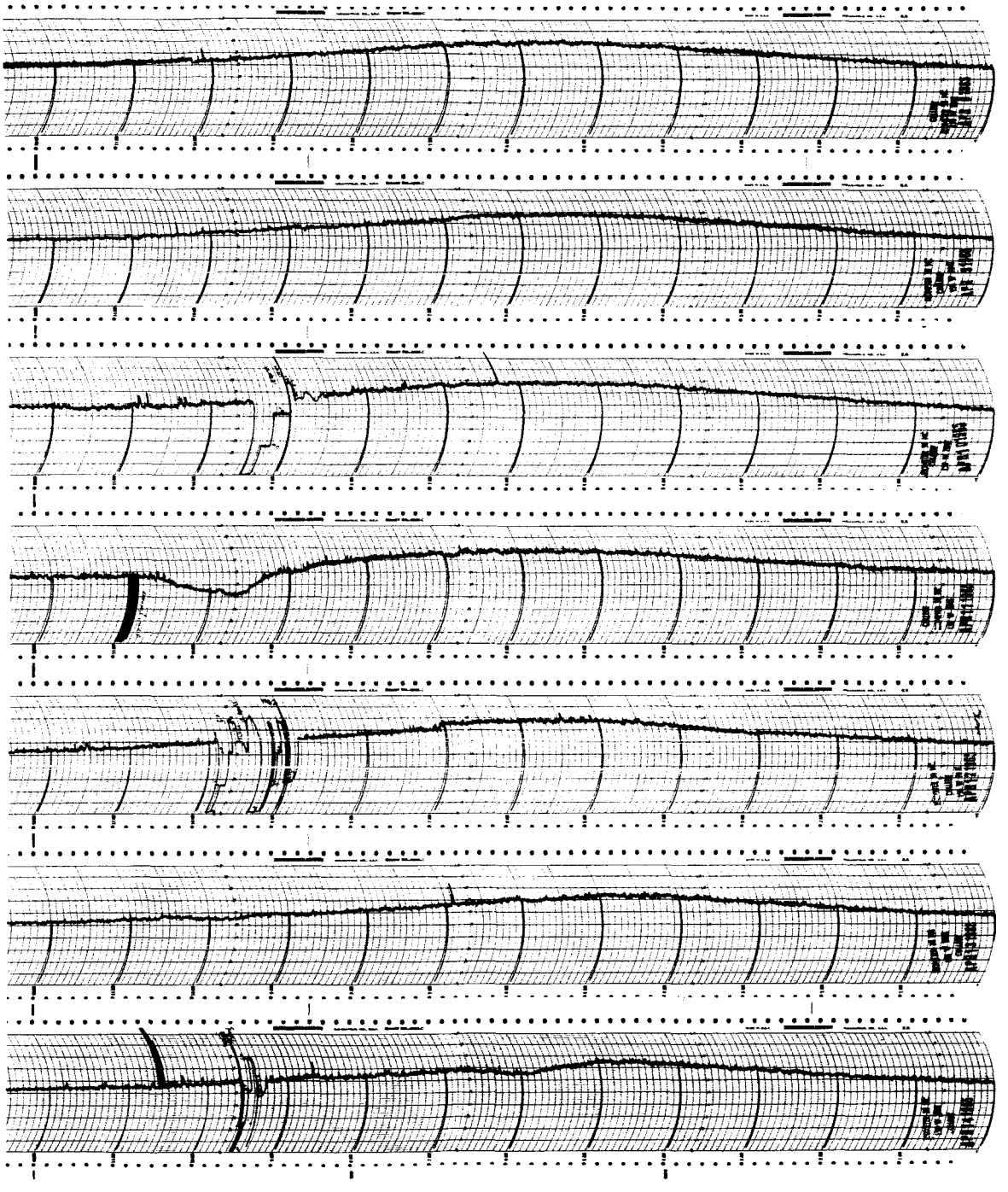
30 MC/S COSMIC NOISE

APR 1965 COLLEGE 12



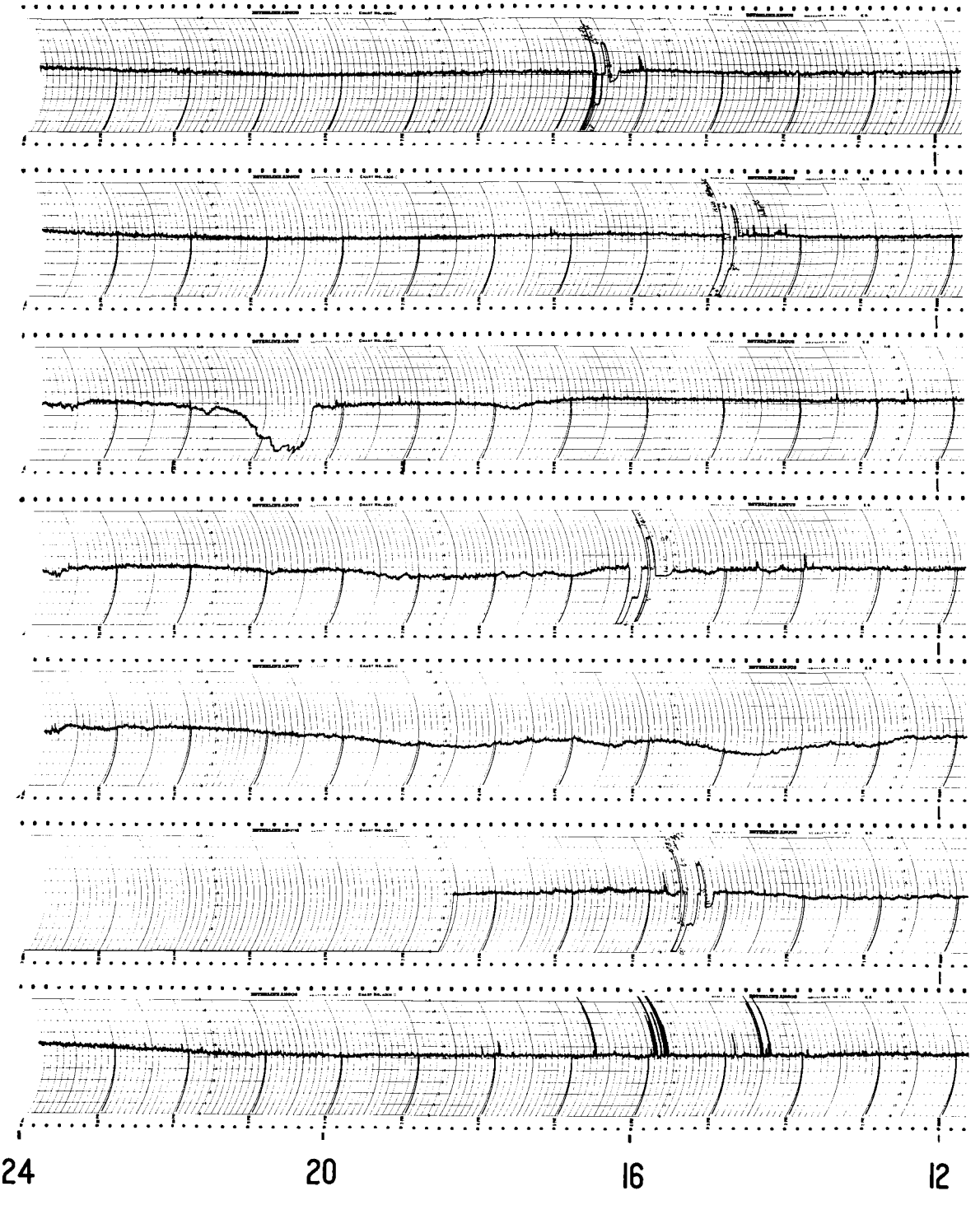
150° WEST MERIDIAN TIME

12 ALASKA APR 1965



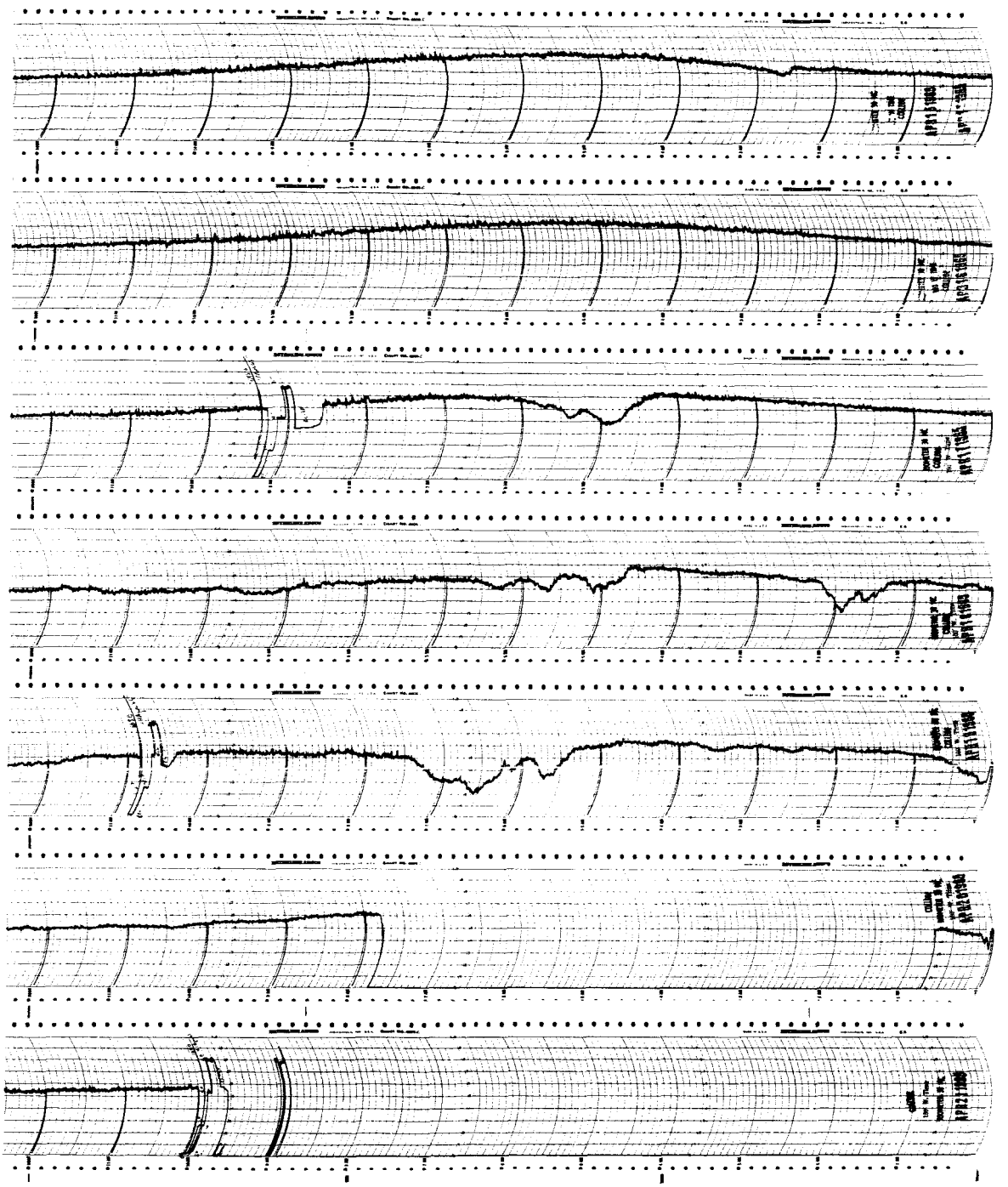
30 MC/S COSMIC NOISE

APR 1965 COLLEGE 12



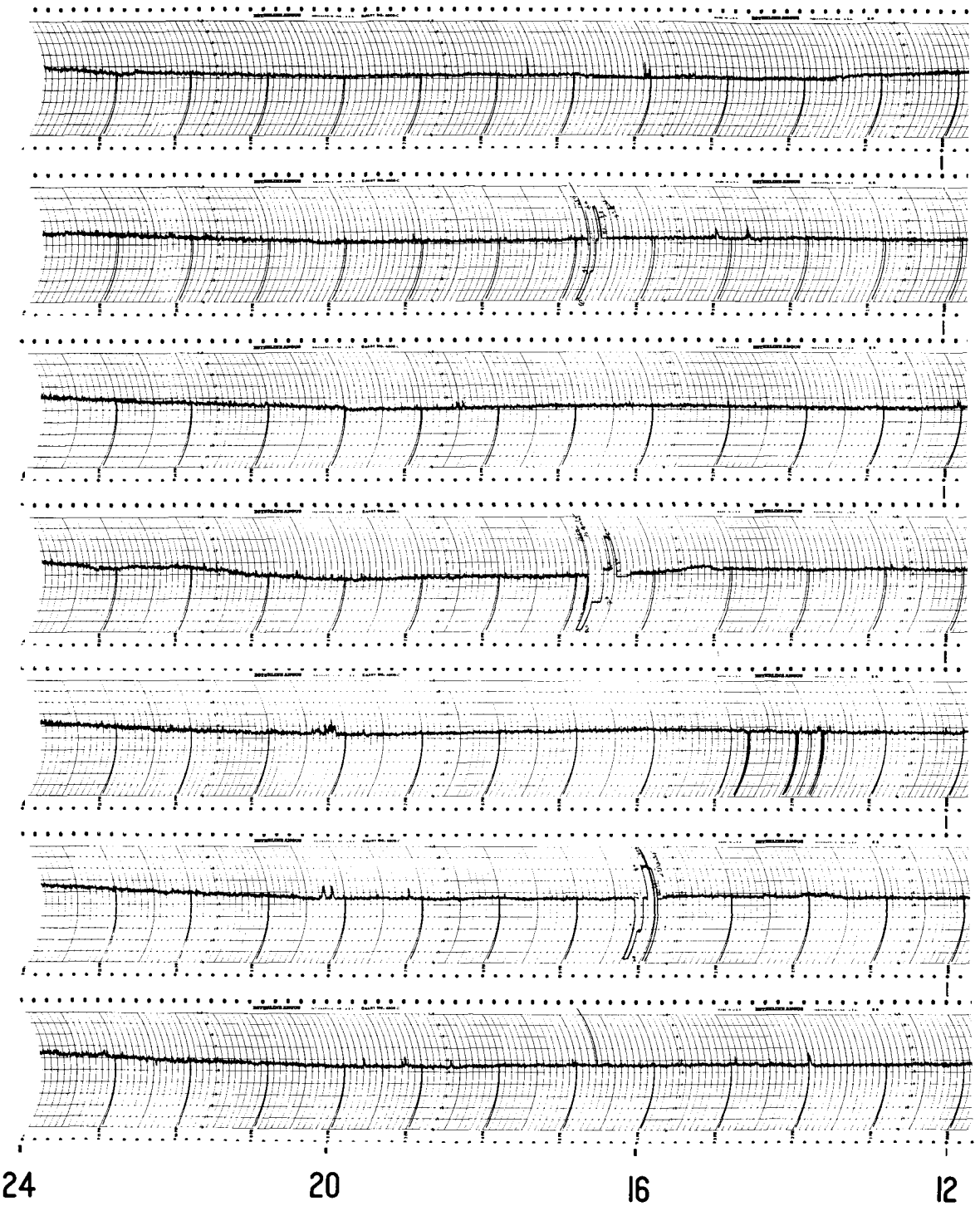
150° WEST MERIDIAN TIME

12 ALASKA APR 1965



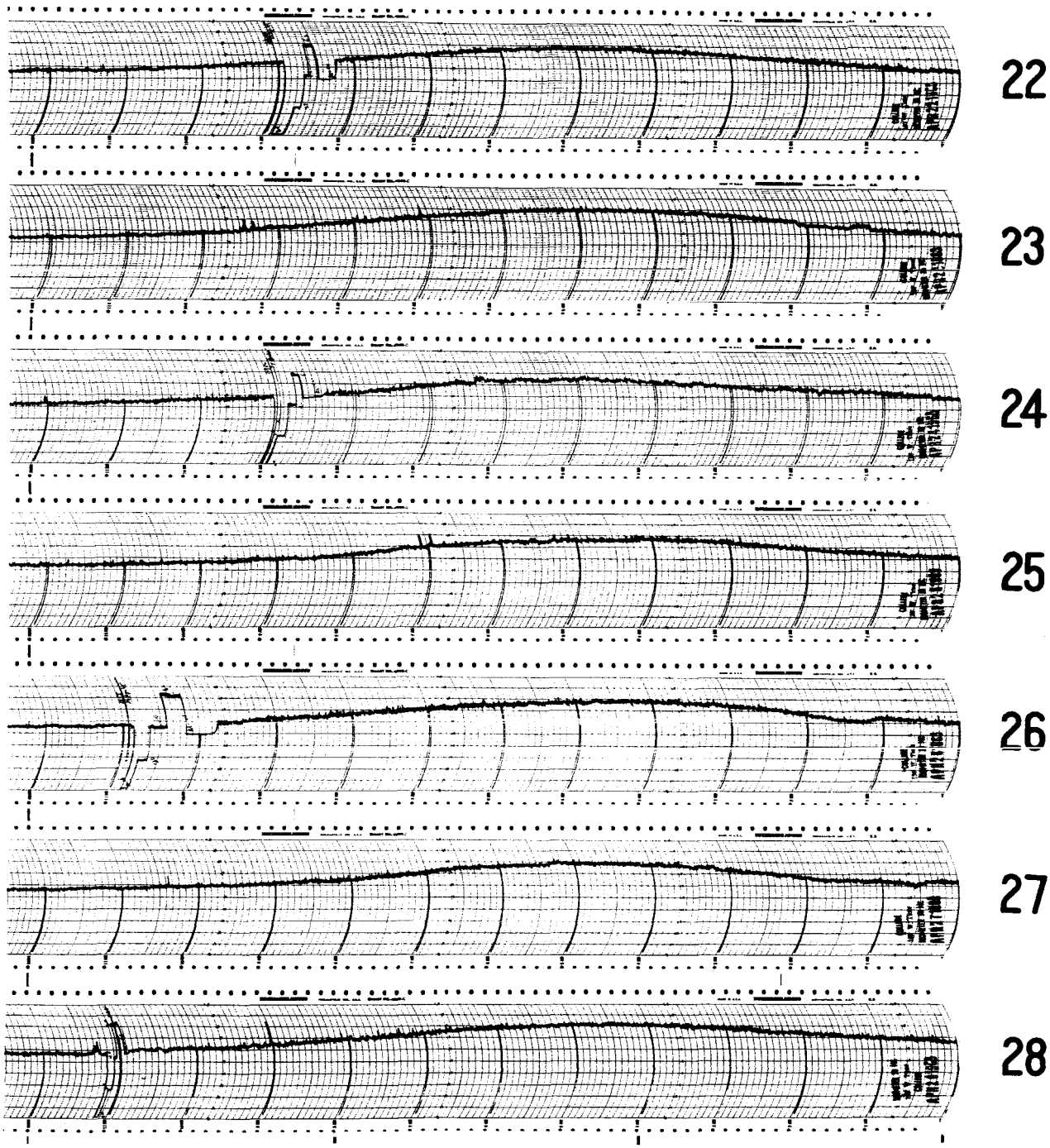
30 MC/S COSMIC NOISE

APR 1965 COLLEGE 12



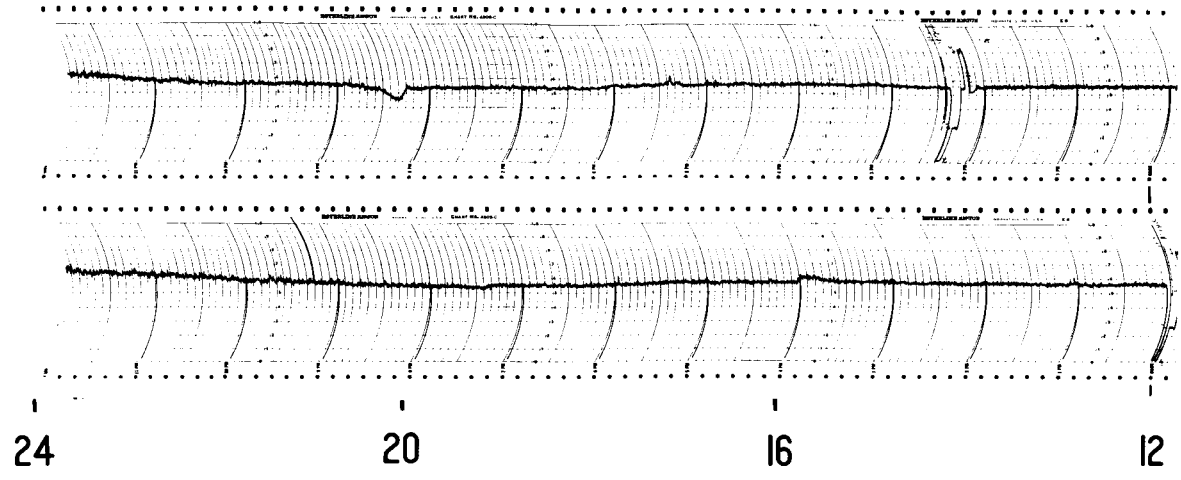
150° WEST MERIDIAN TIME

12 ALASKA APR 1965



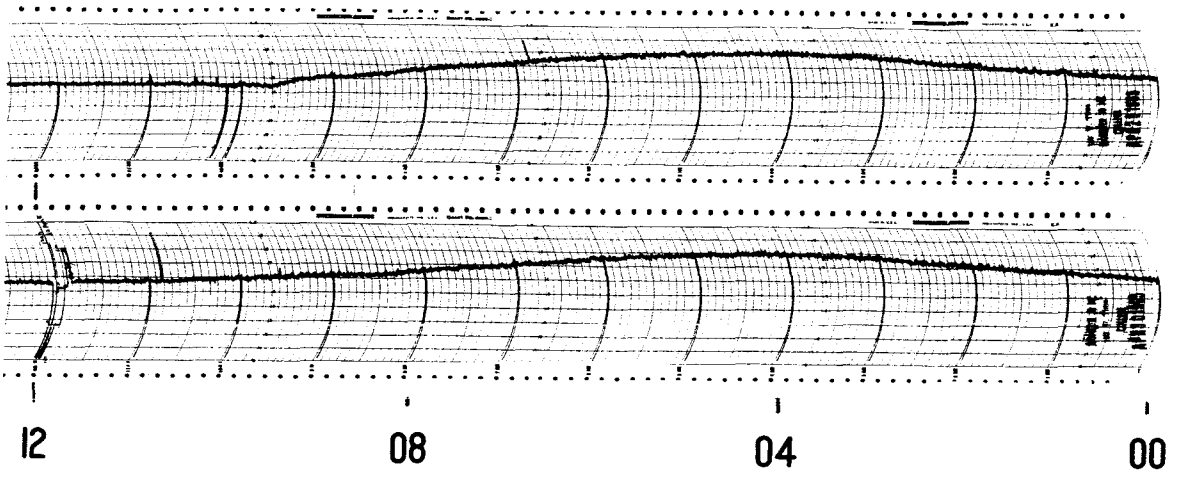
30 MC/S COSMIC NOISE

APR 1965 COLLEGE 12



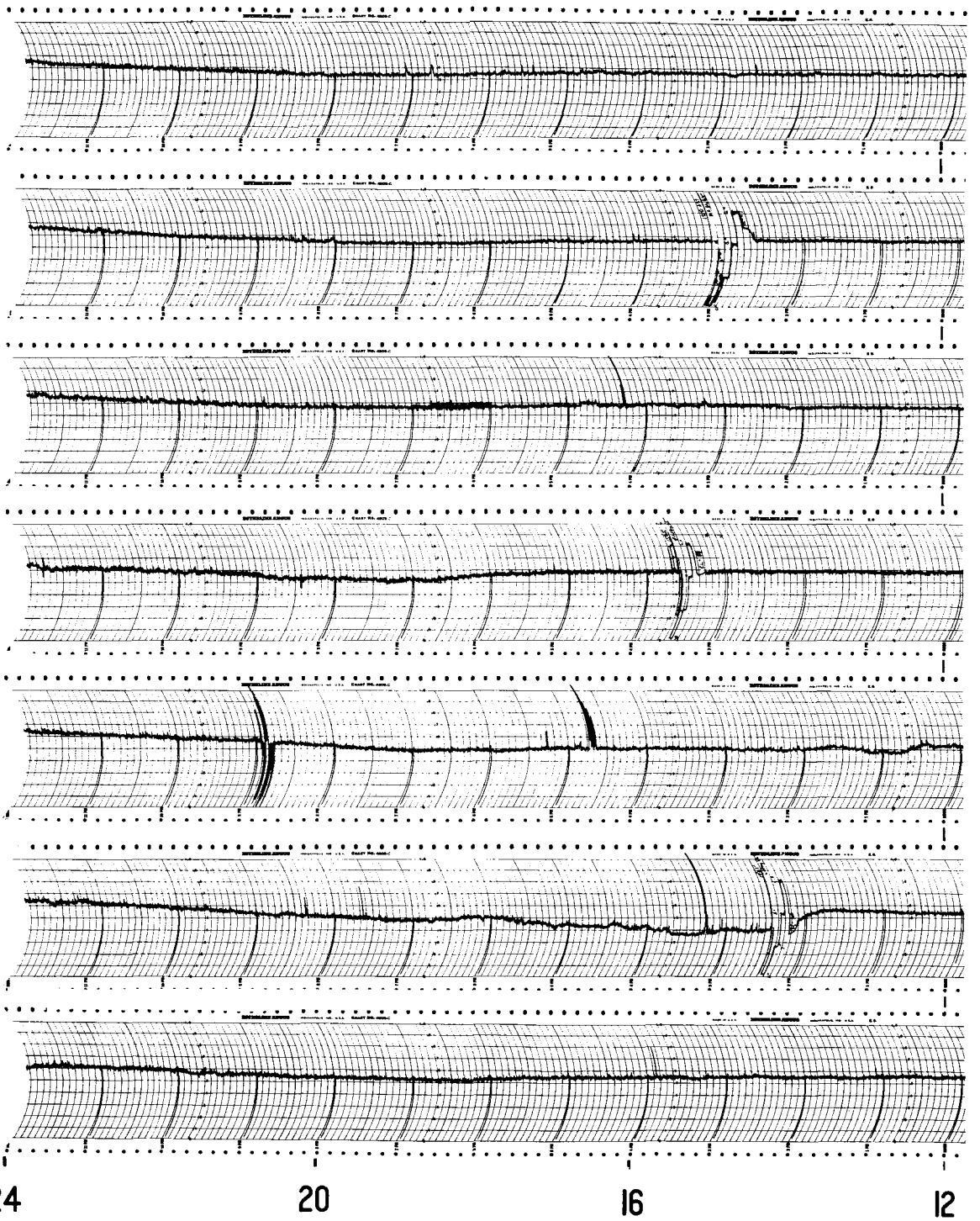
150° WEST MERIDIAN TIME

12 ALASKA APR 1965



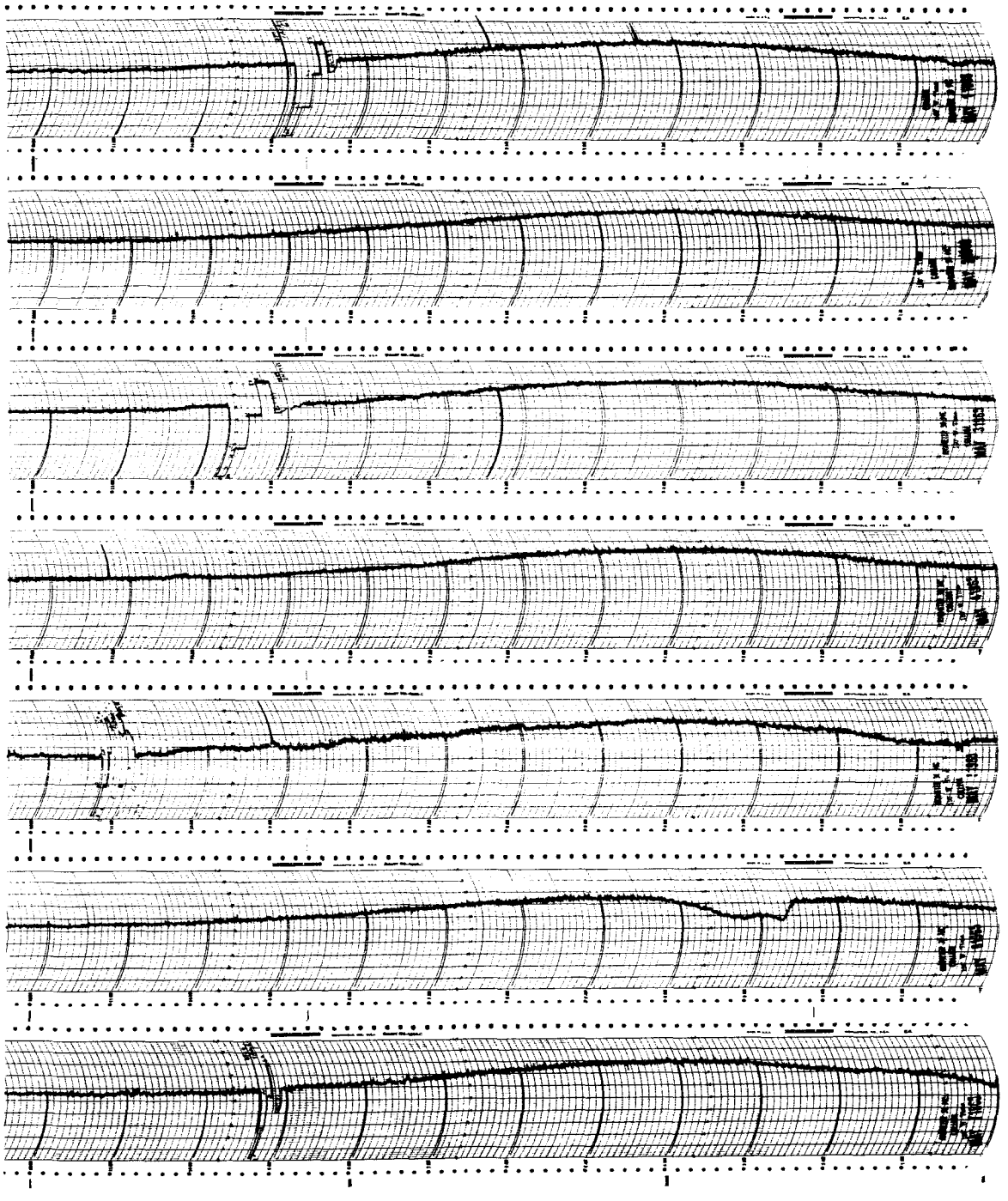
30 MC/S COSMIC NOISE

MAY 1965 COLLEGE 12



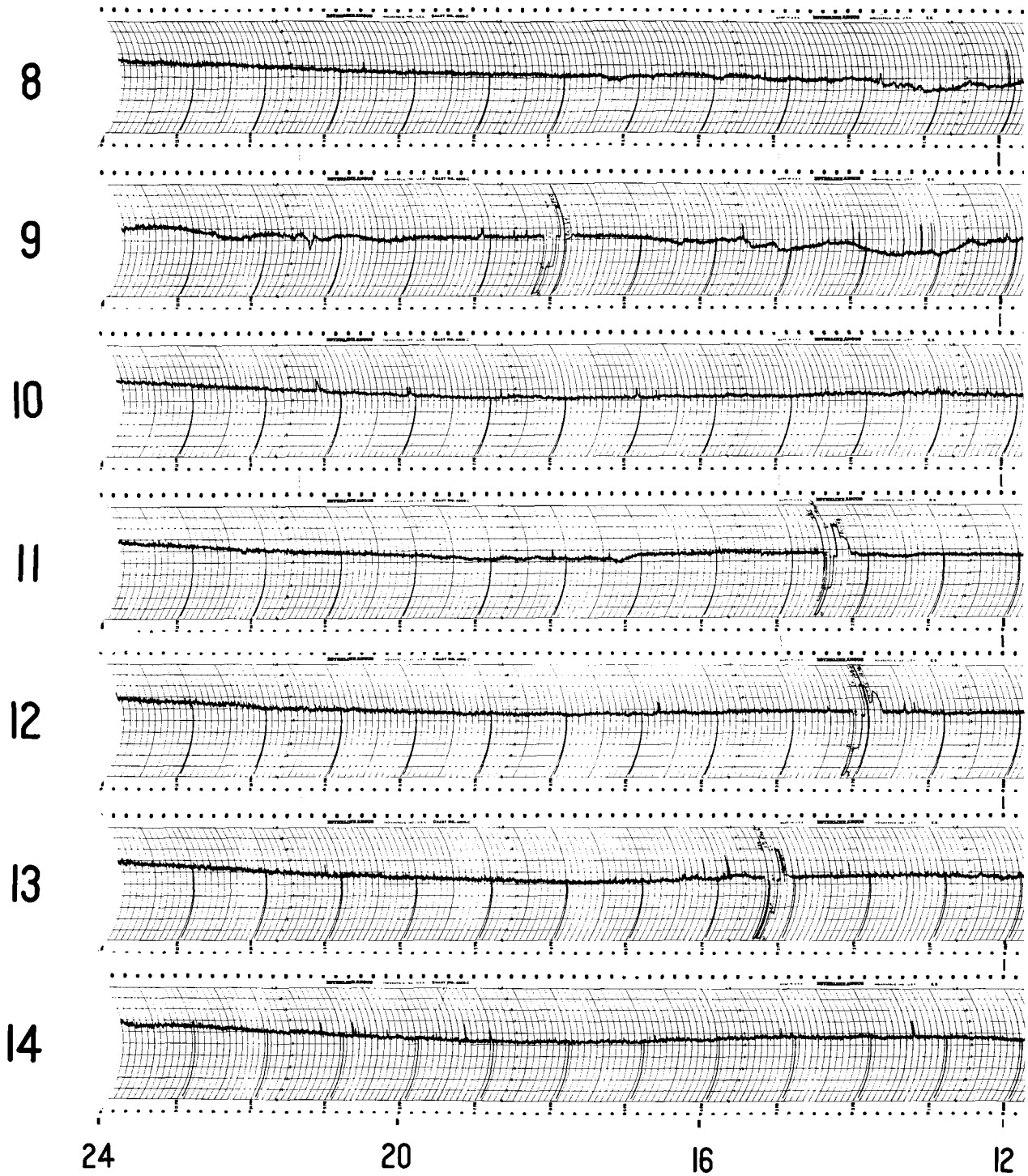
150° WEST MERIDIAN TIME

12 ALASKA MAY 1965



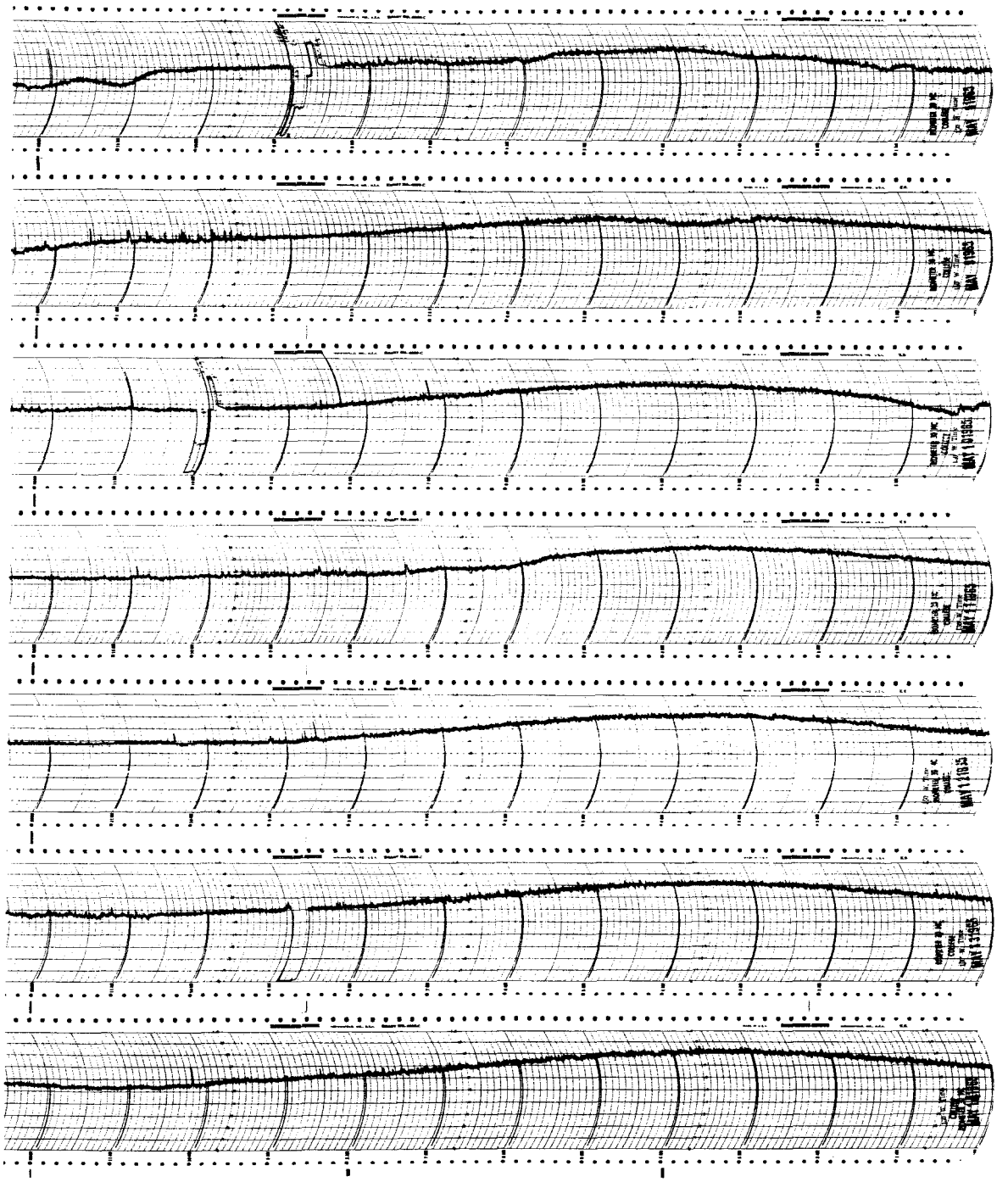
30 MC/S COSMIC NOISE

MAY 1965 COLLEGE 12



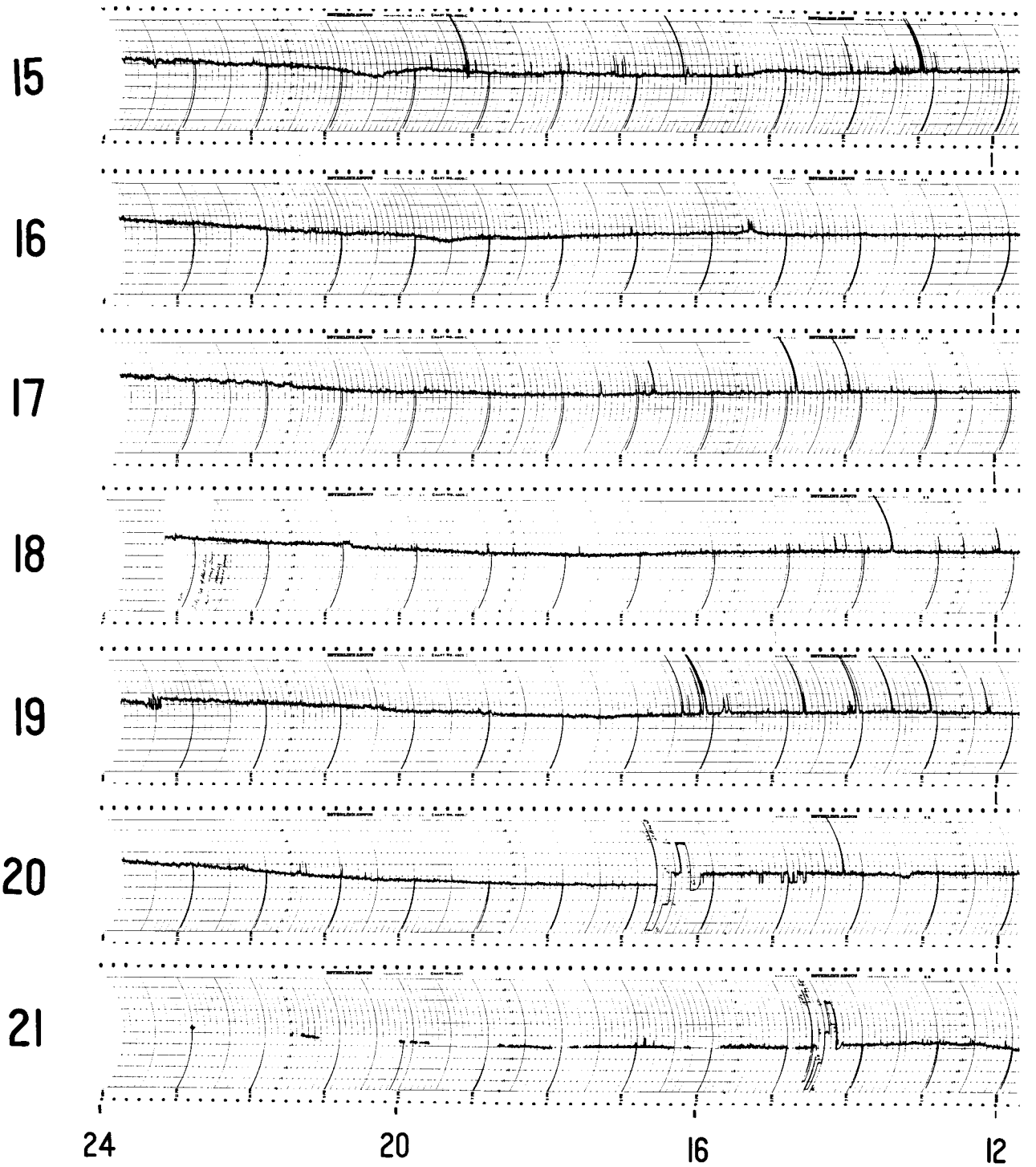
150° WEST MERIDIAN TIME

12 ALASKA MAY 1965



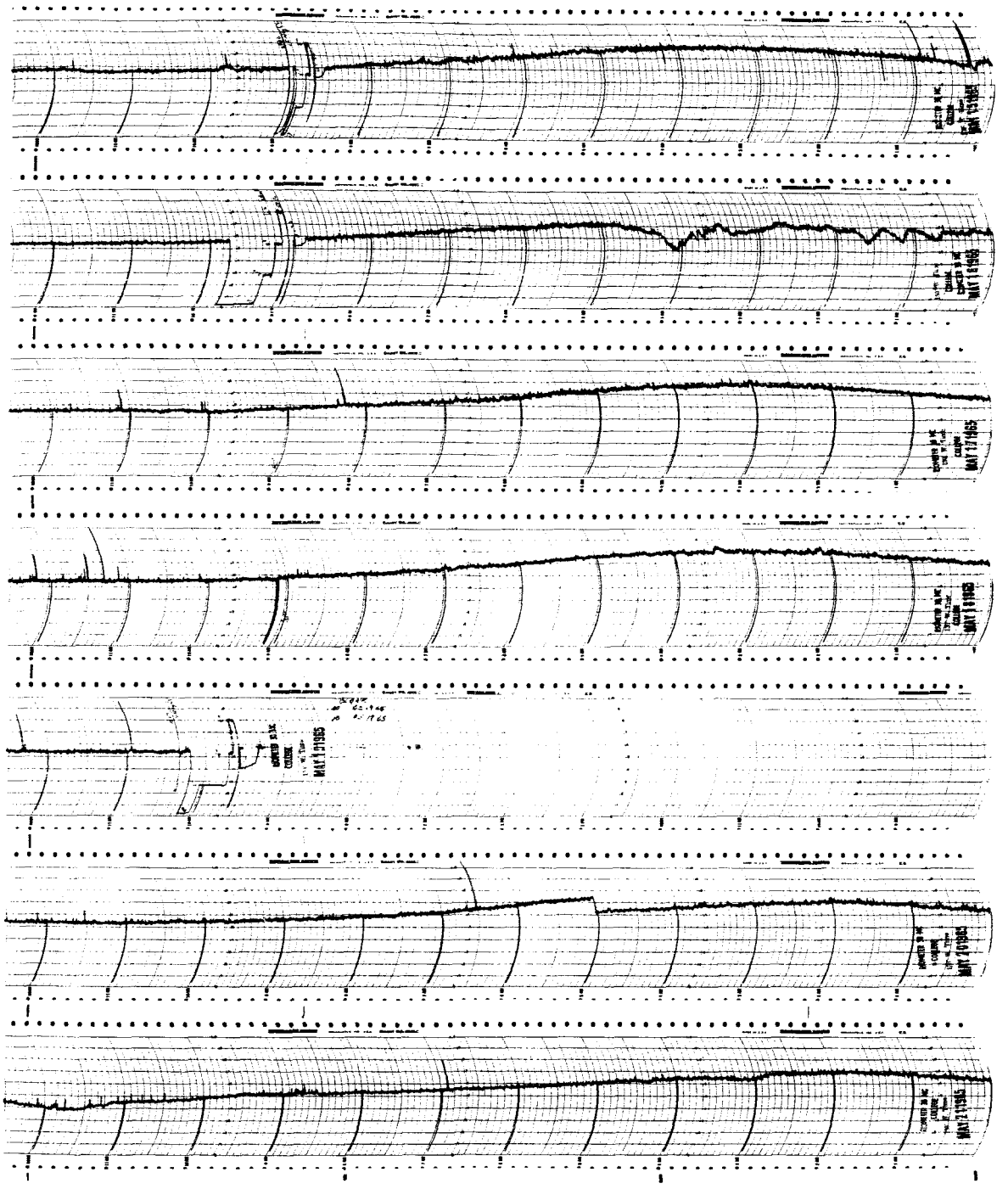
30 MC/S COSMIC NOISE

MAY 1965 COLLEGE 12



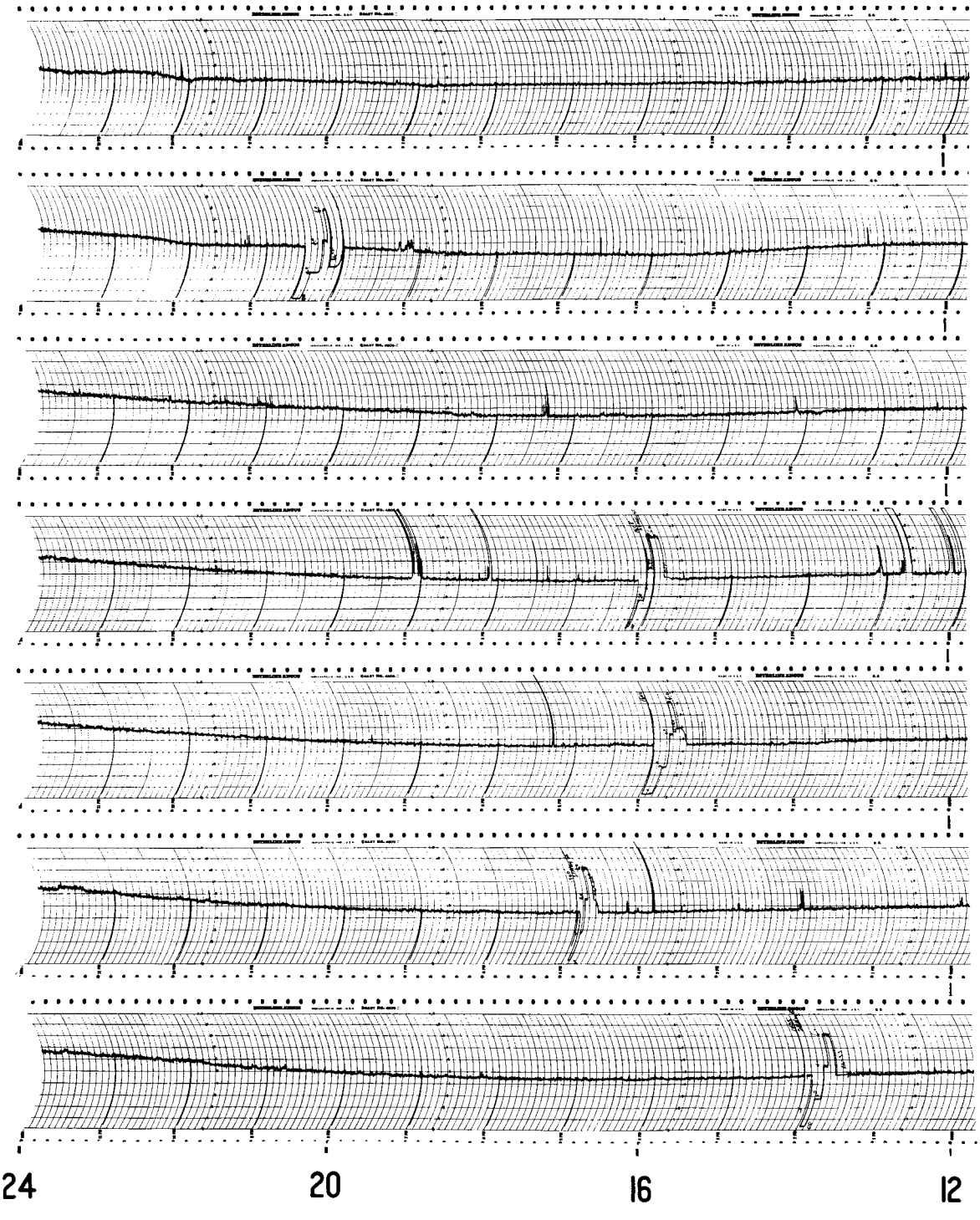
150° WEST MERIDIAN TIME

12 ALASKA MAY 1965



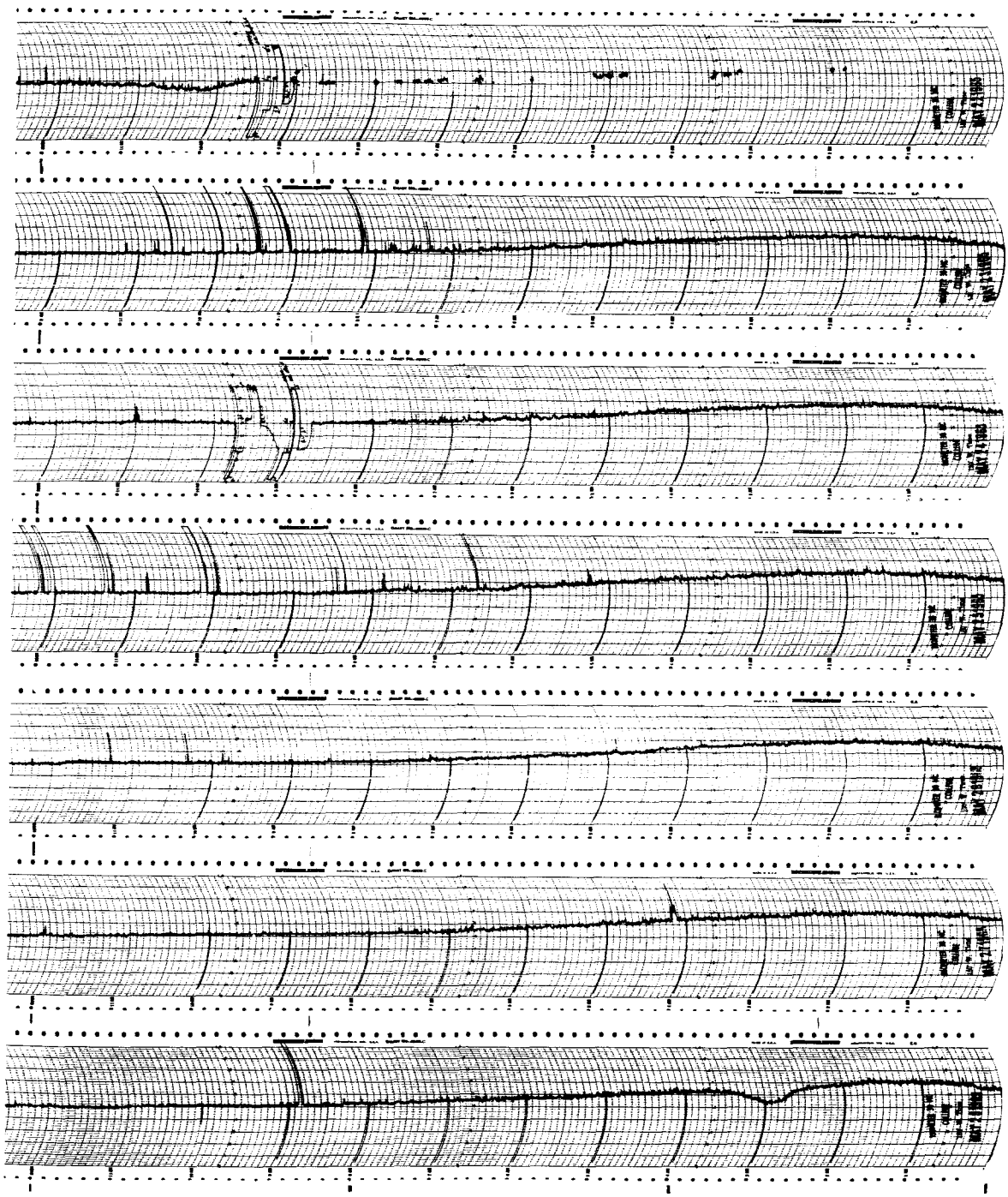
30 MC/S COSMIC NOISE

MAY 1965 COLLEGE 12



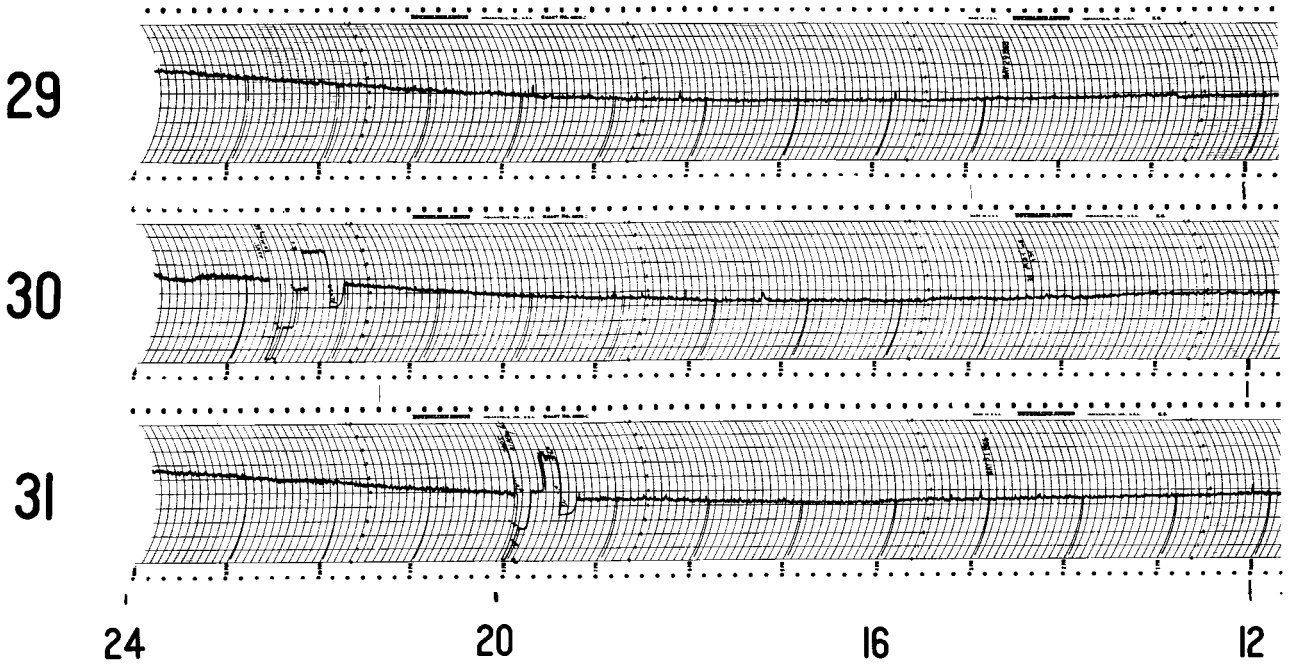
150° WEST MERIDIAN TIME

12 ALASKA MAY 1965



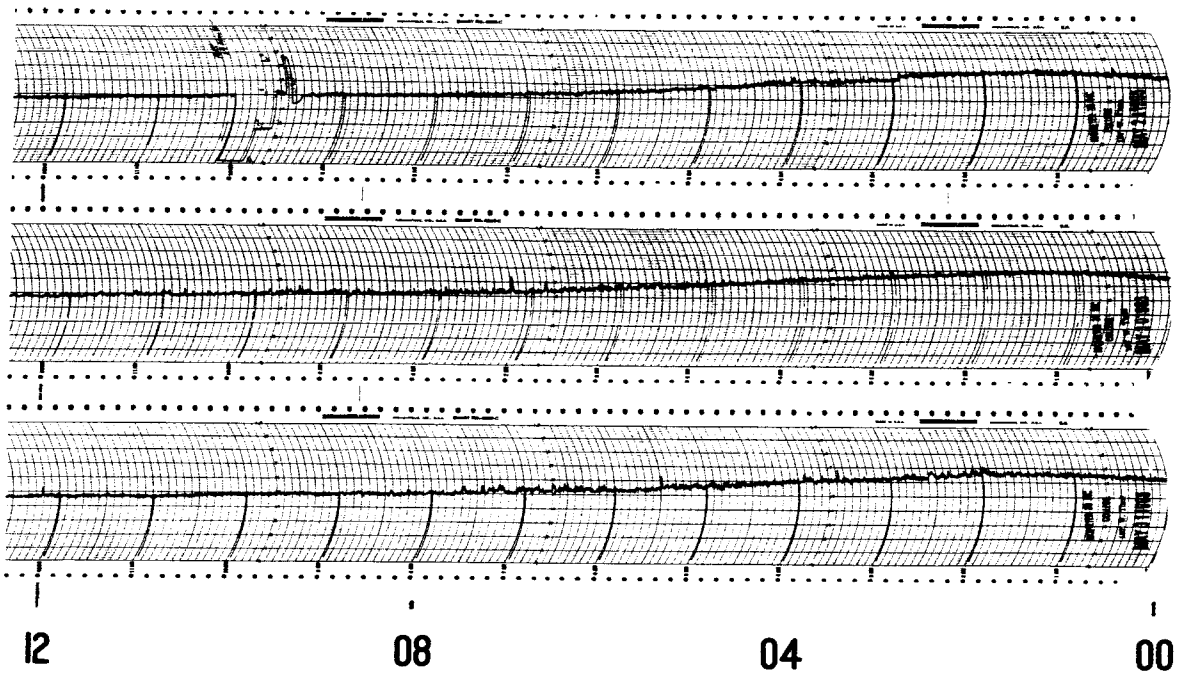
30 MC/S COSMIC NOISE

MAY 1965 COLLEGE 12



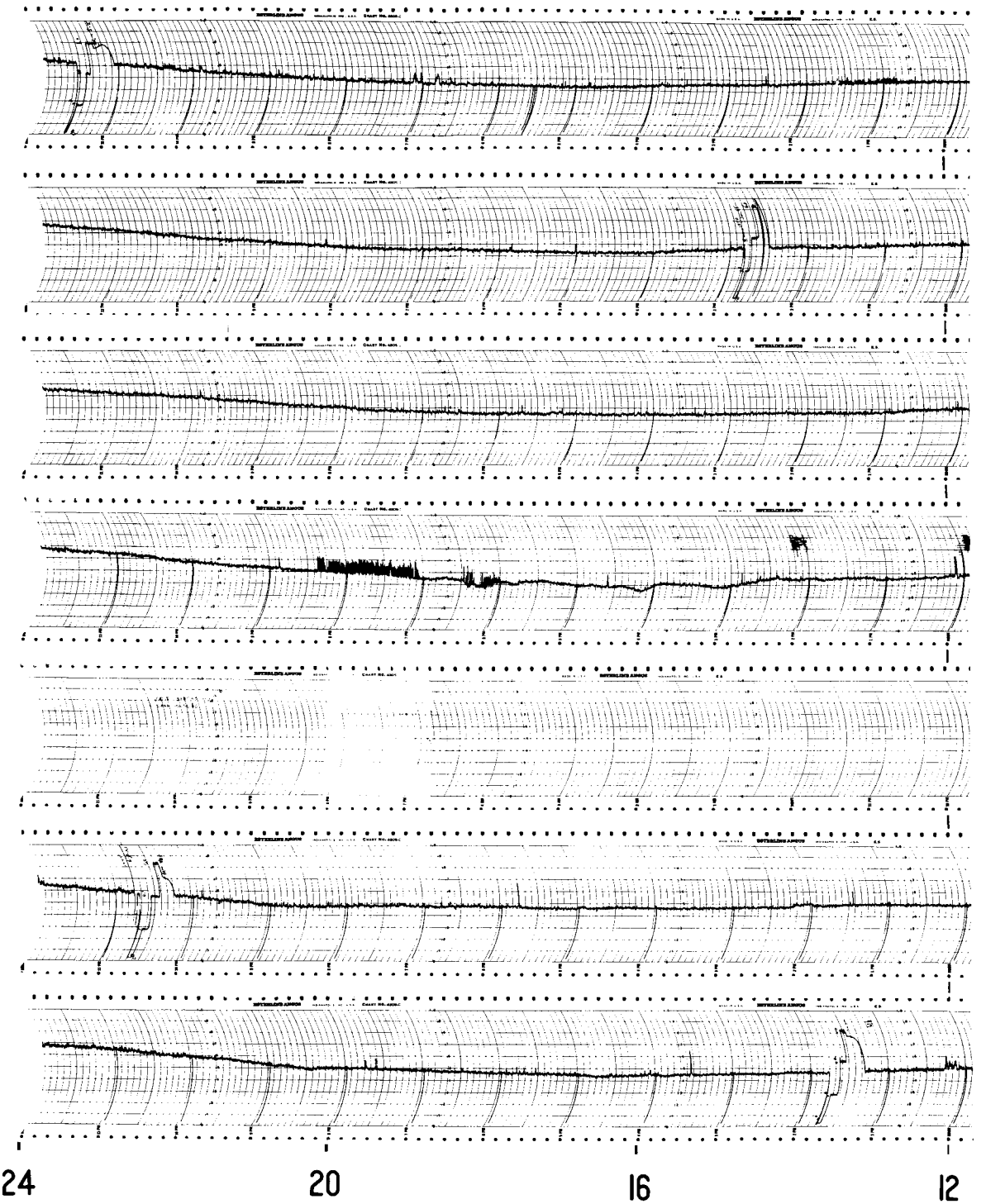
150° WEST MERIDIAN TIME

12 ALASKA MAY 1965



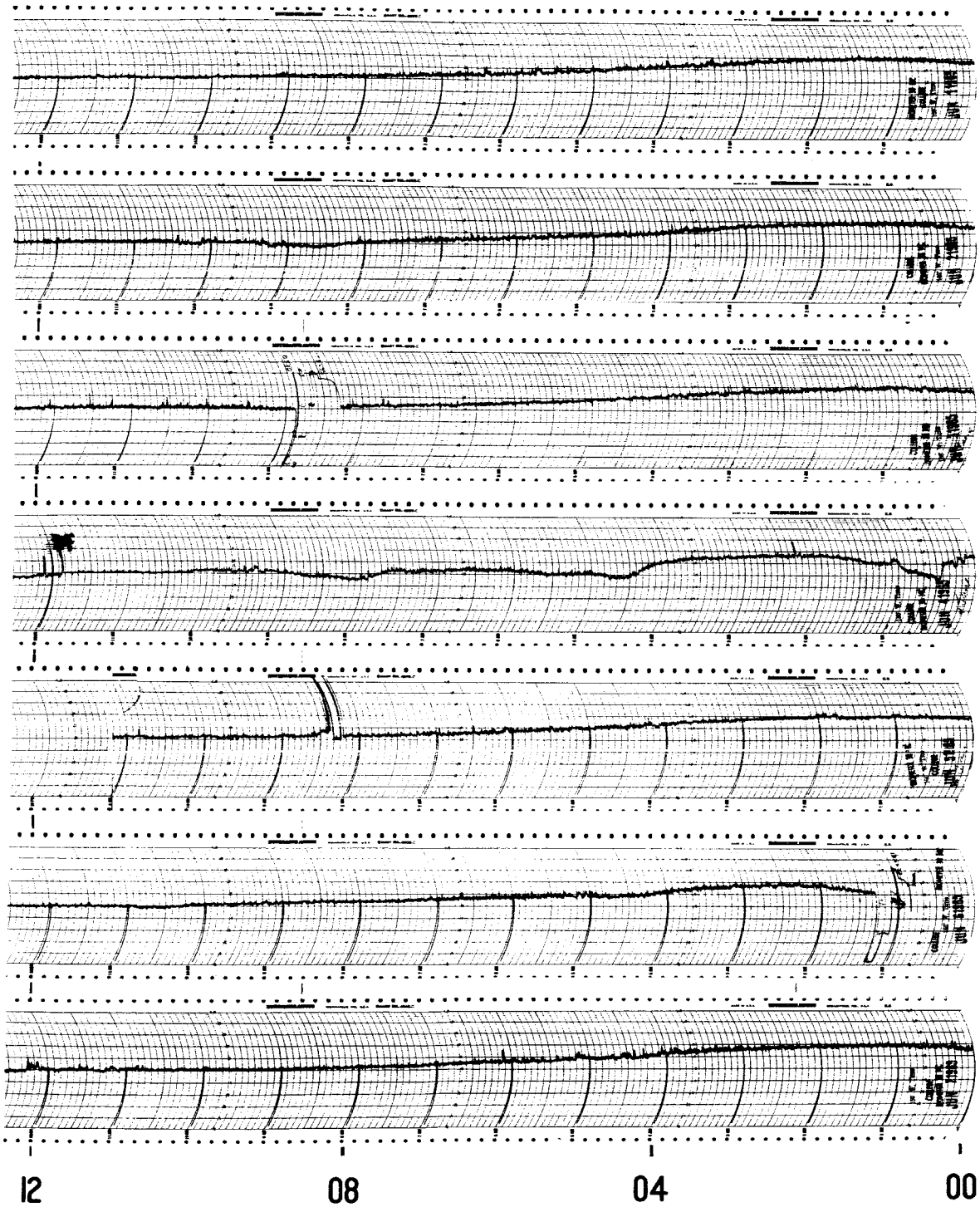
30 MC/S COSMIC NOISE

JUN 1965 COLLEGE 12



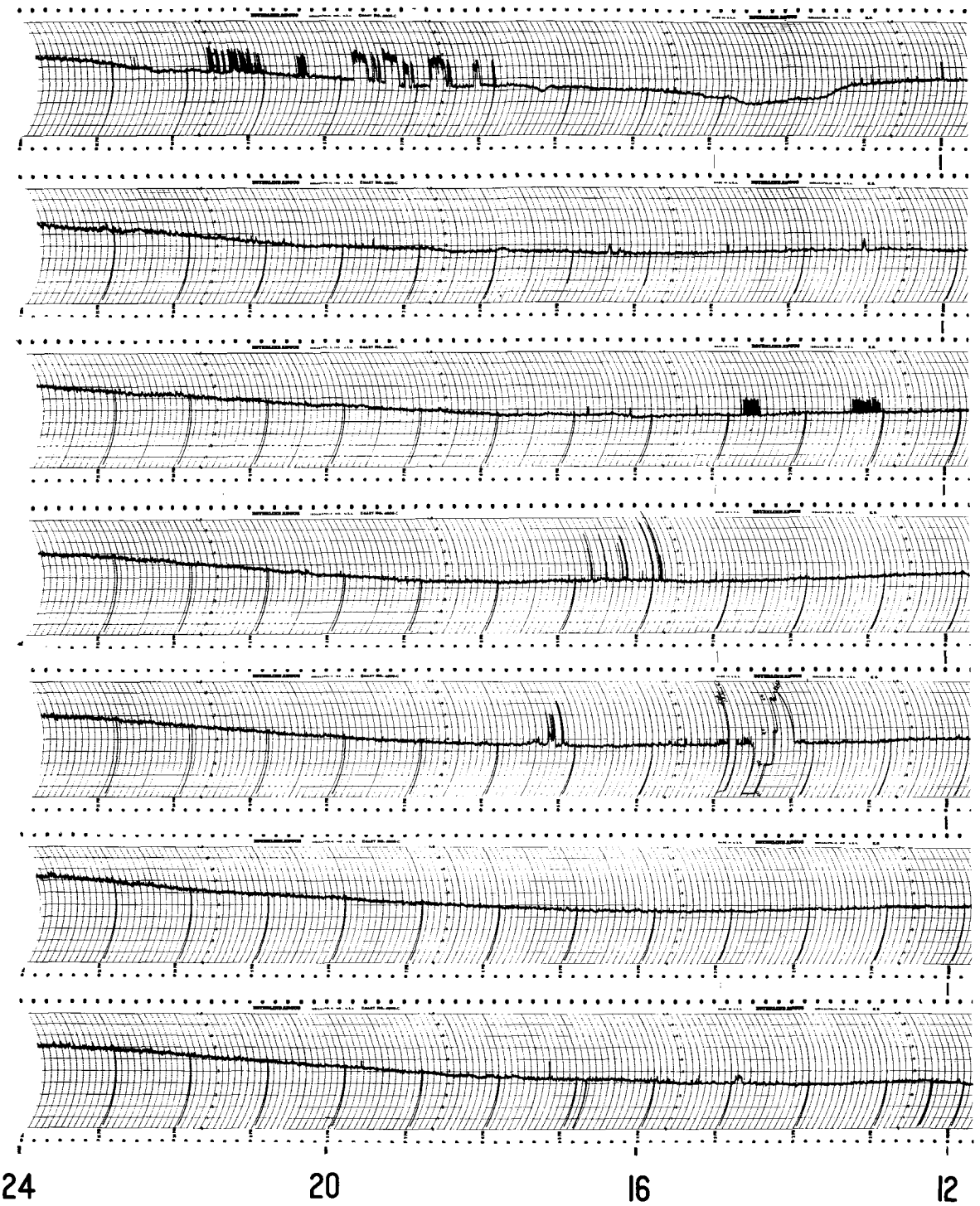
150° WEST MERIDIAN TIME

12 ALASKA JUN 1965



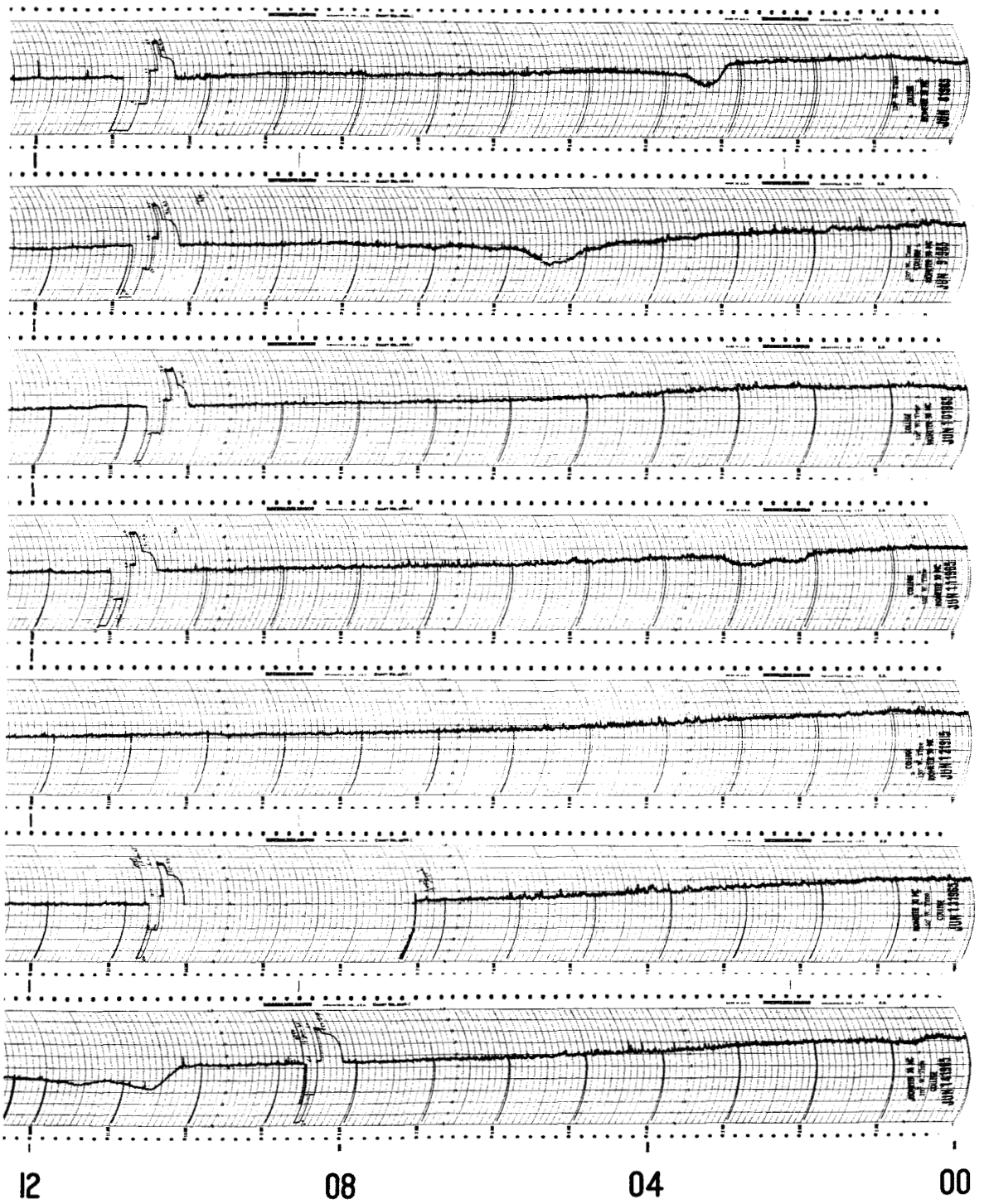
30 MC/S COSMIC NOISE

JUN 1965 COLLEGE 12



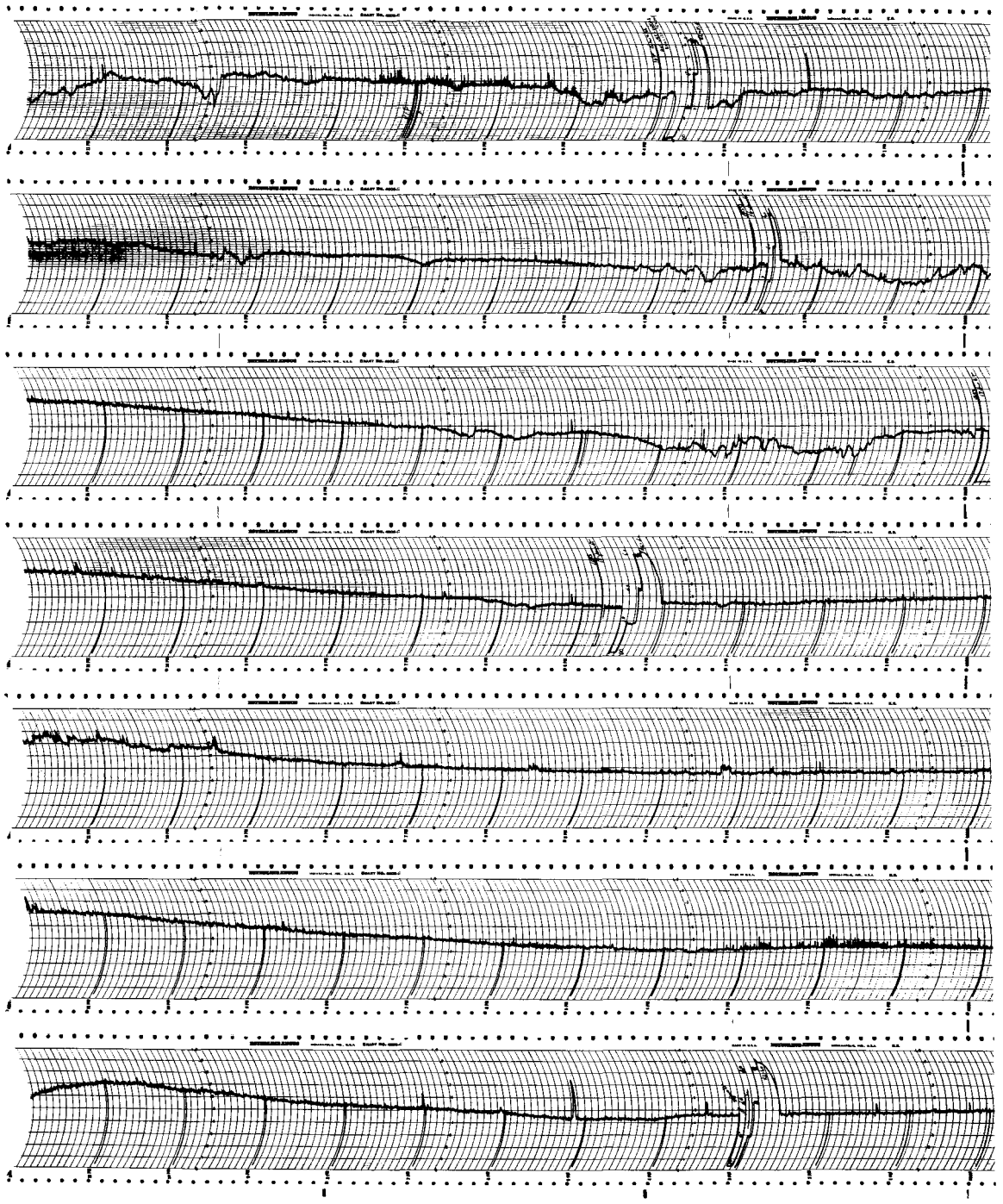
150° WEST MERIDIAN TIME

12 ALASKA JUN 1965



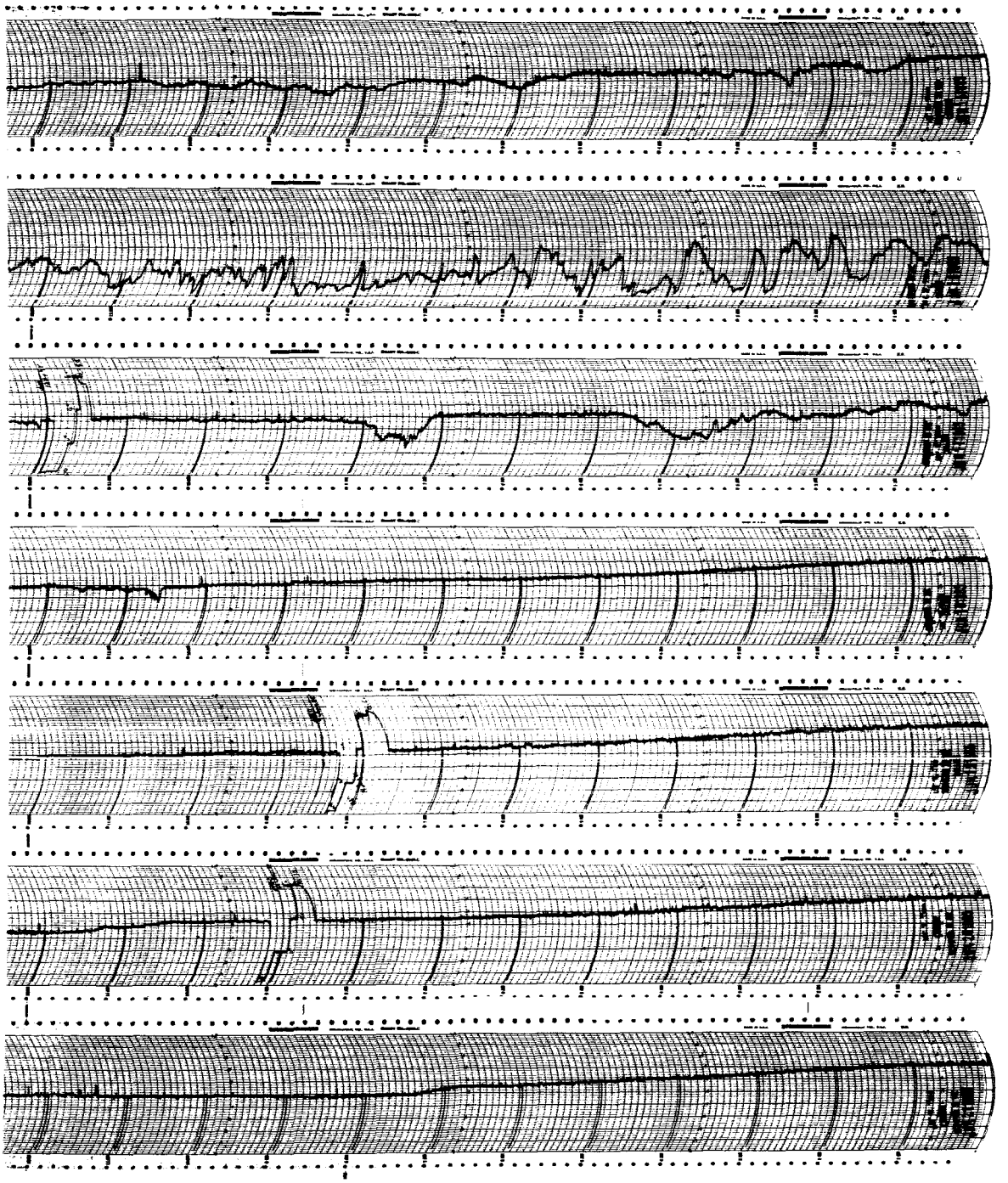
30 MC/S COSMIC NOISE

JUN 1965 COLLEGE 12



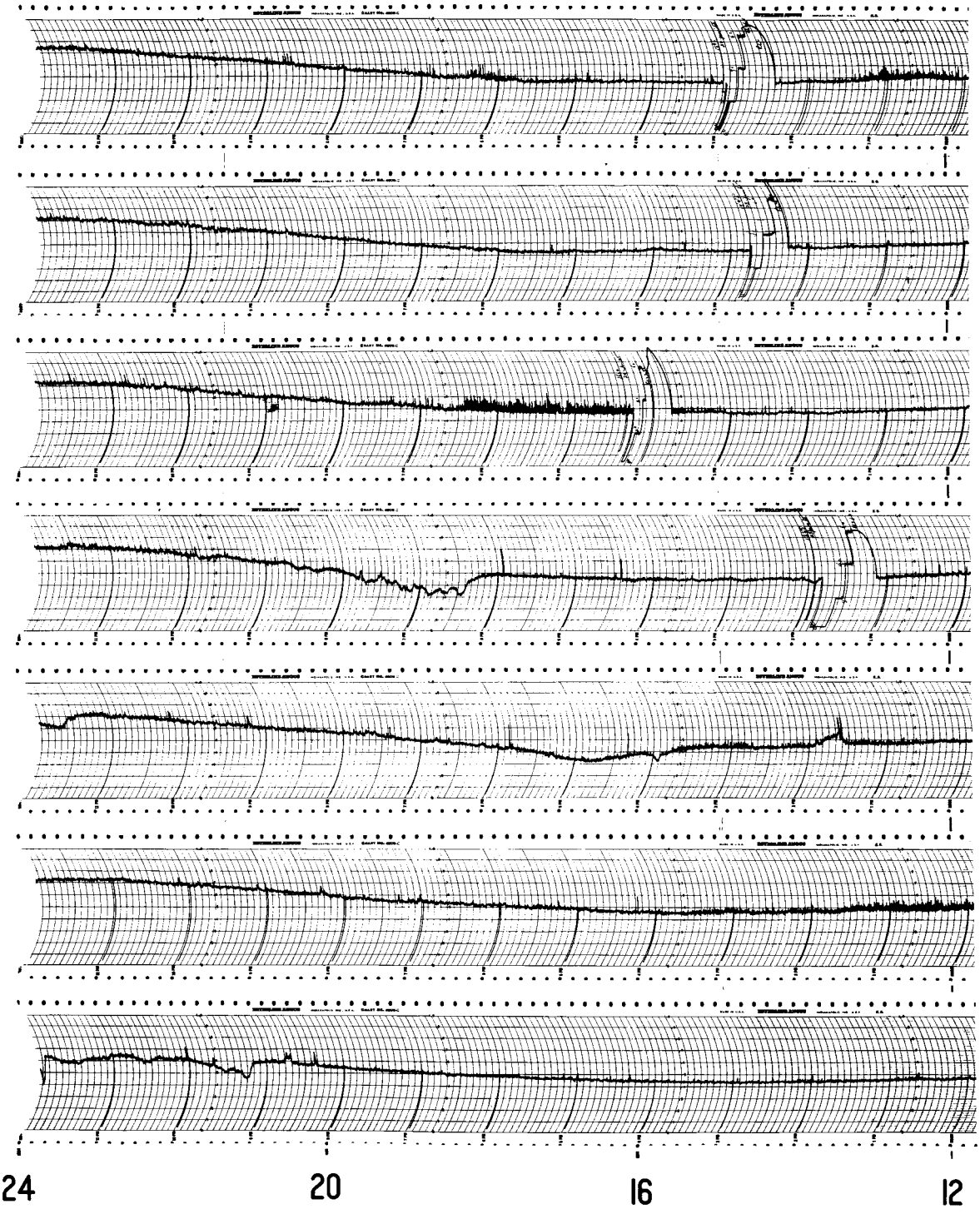
150° WEST MERIDIAN TIME

12 ALASKA JUN 1965



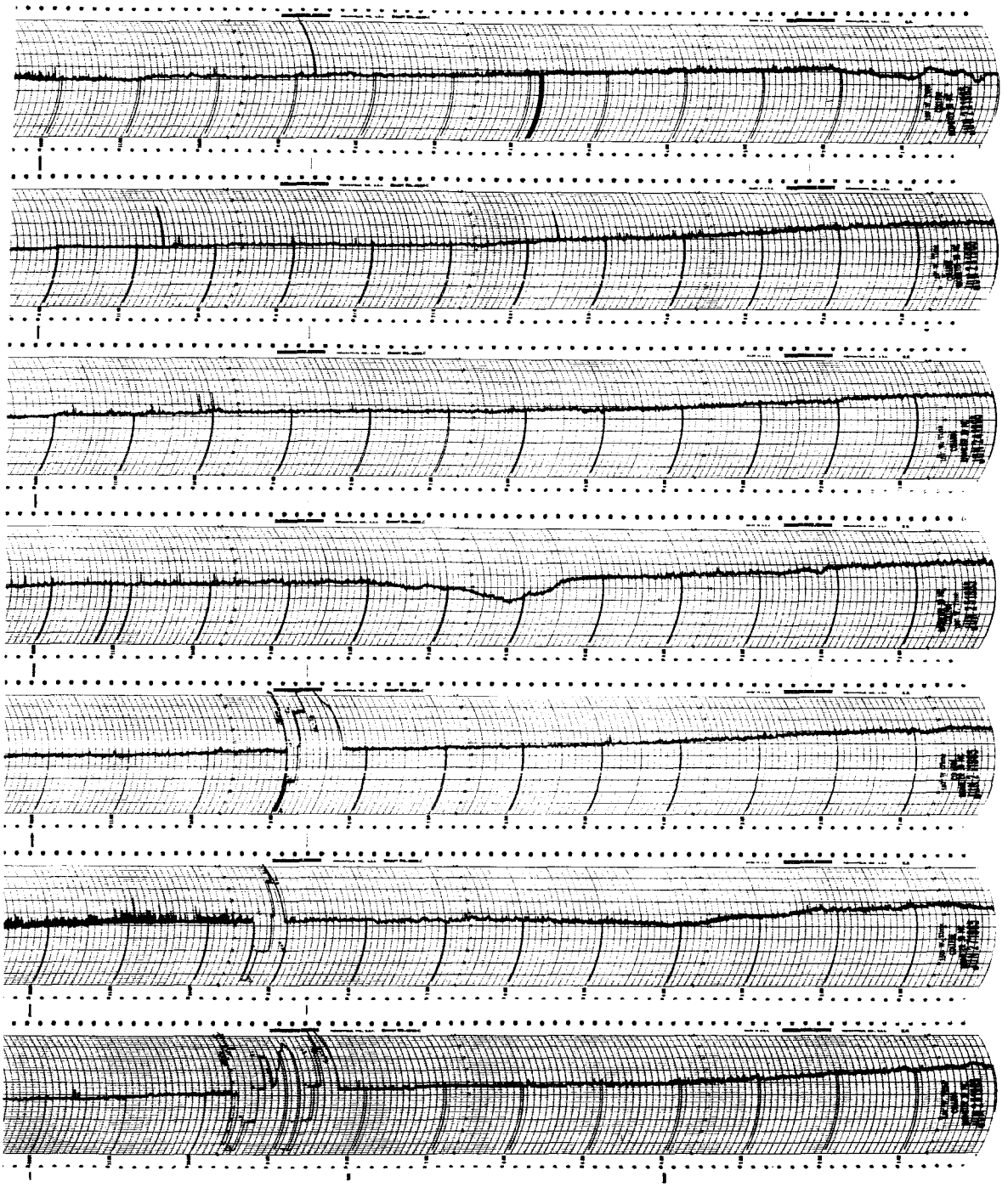
30 MC/S COSMIC NOISE

JUN 1965 COLLEGE 12



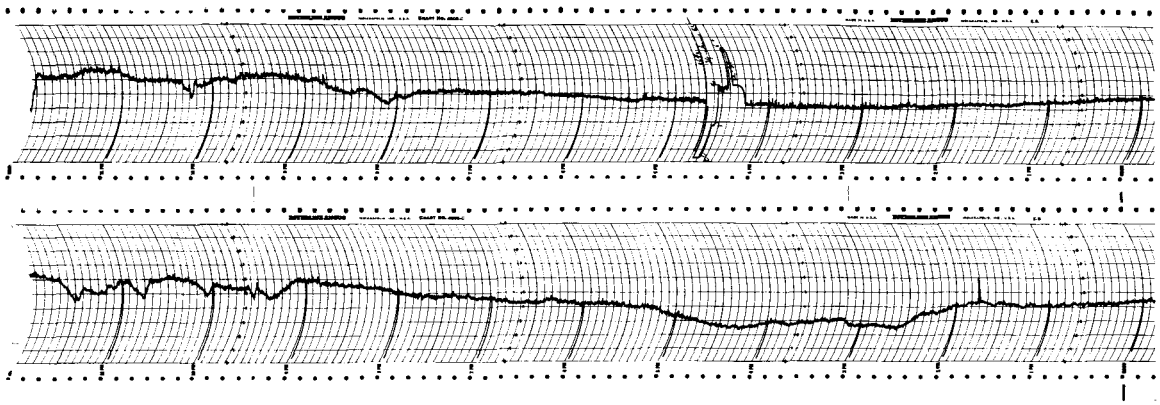
150° WEST MERIDIAN TIME

12 ALASKA JUN 1965



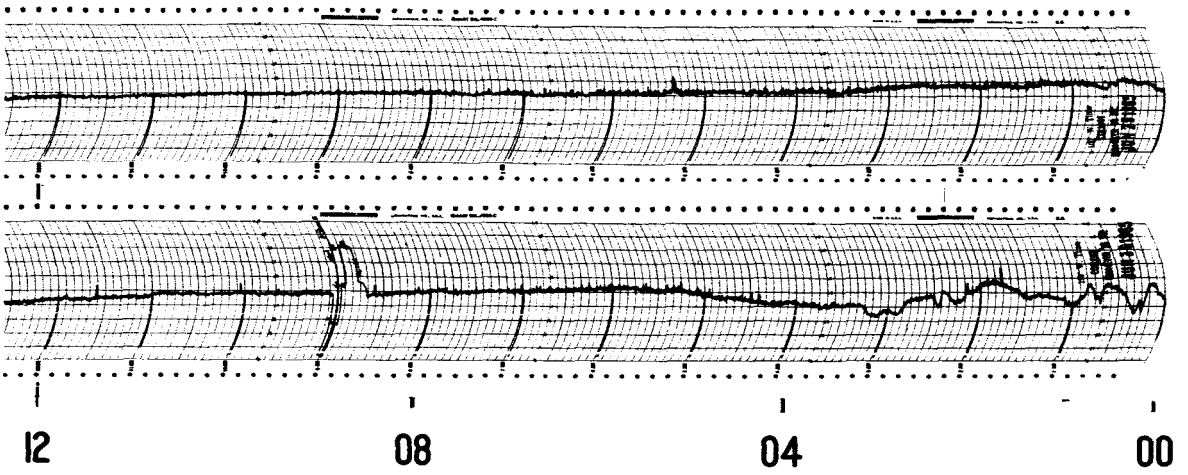
30 MC/S COSMIC NOISE

JUN 1965 COLLEGE 12



150° WEST MERIDIAN TIME

12 ALASKA JUN 1965



30 MC/S COSMIC NOISE

TELLURIC CURRENT ACTIVITY

V. P. Hessler
Professor of Geophysics

The electrode field is located south of the Geophysical Institute Ballaine Lake Field site (64°51'N and 147°50'W geographic and 64°37'N and 256°30'E geomagnetic). The 200 meter spaced electrodes are aligned in the N-S geographic meridian.

N-S telluric current records. These records are made on an L&N Speedomax recorder, with a 5 second full scale response rate, at 3 in/hr and at 1000 mv/km full scale range. Since the telluric perturbation vector tends to be linearly polarized (N 35° W geographic at this site) the N-S trace alone gives a good indication of the total activity. These telluric records always carry much more fine structure than the corresponding magnetograms and thus are a more sensitive indicator of ionospheric activity.

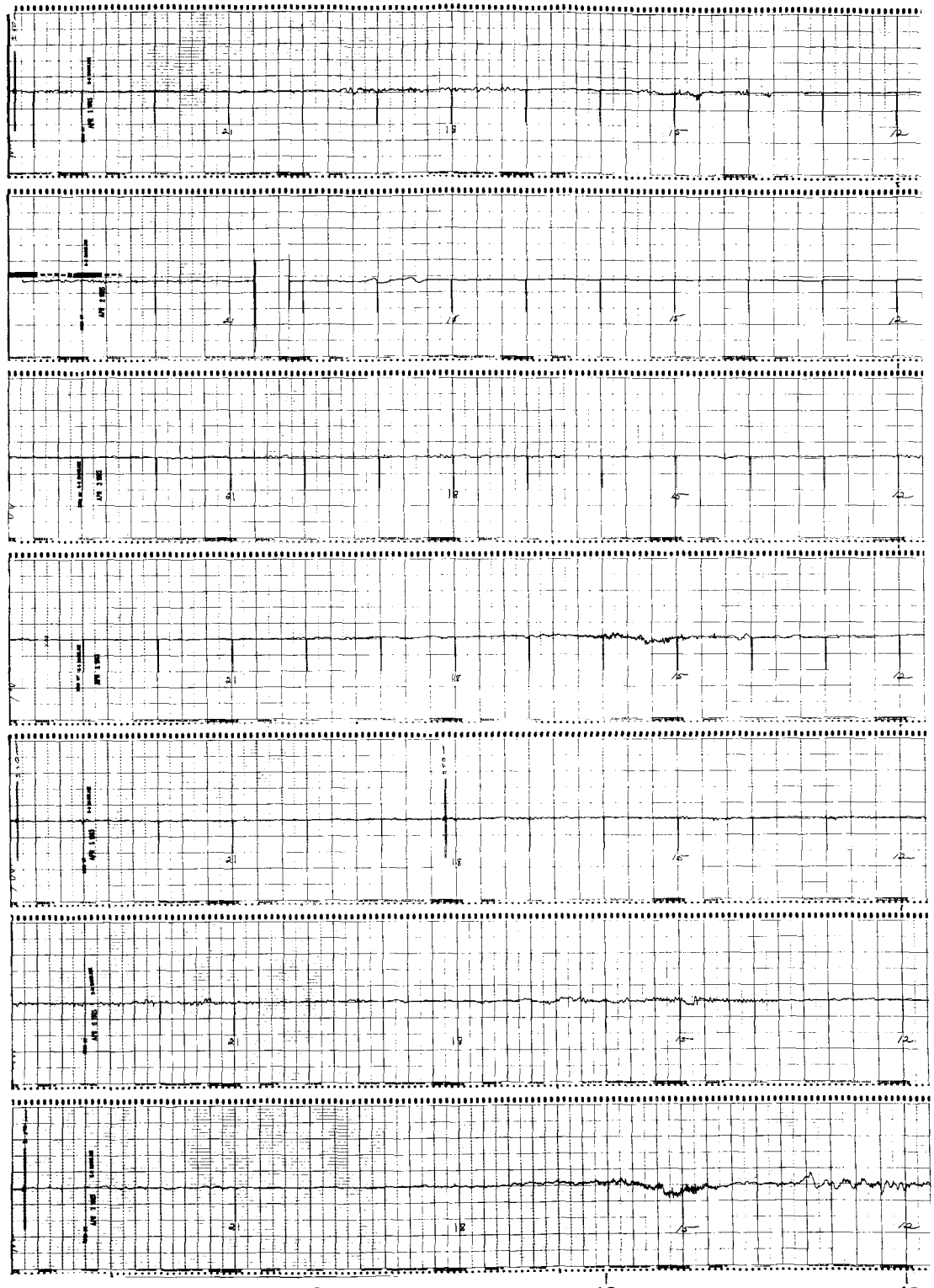
N-S telluric amplitude activity. The N-S telluric trace is scaled for hourly values of arithmetic range in a manner similar to that used in scaling magnetic K-indices. By range is meant the difference between the greatest positive and negative departure from an arbitrarily assigned zero trace (the diurnal variation at College is negligible in comparison with the disturbance phenomena). Monthly correlation coefficients between magnetic A figures and telluric amplitude scalings are always close to 0.95. Thus the telluric amplitude activity scalings presented herein are an index of ionospheric activity similar to the K-indices, but in more detail since the scalings are arithmetic and hourly in contrast to the 3-hourly quasi-logarithmic K-indices.

Telluric fluctuation activity. The fluctuation count is made on the same recorder as the N-S trace. The equipment consists of a 10-point stepping relay, a clutch driven microswitch, and an operations pen attached to the recorder. The switch is closed as the pen starts upscale and opens as it starts downscale. Thus within the sensitivity of the equipment the stepping relay advances one step for each cycle of fluctuations regardless of amplitude or pen position. At a recorder full scale range of 1000 mv/km the equipment will record fluctuations down to 5 mv/km. The data serve as an index of micropulsations activity showing diurnal, seasonal and sunspot cycle variations. The nighttime fluctuations are closely correlated with aurorally associated cosmic noise absorption. An indication of the micropulsation period in seconds can be obtained by dividing 3600 by the cycle per hour value.

The collection, analysis, and publication of these telluric current records and scalings is supported in part by the Air Force Cambridge Research Laboratories, Office of Aerospace Research under Contract No. AF 19(628)-1695, monitored by Mr. Elwood Maple.

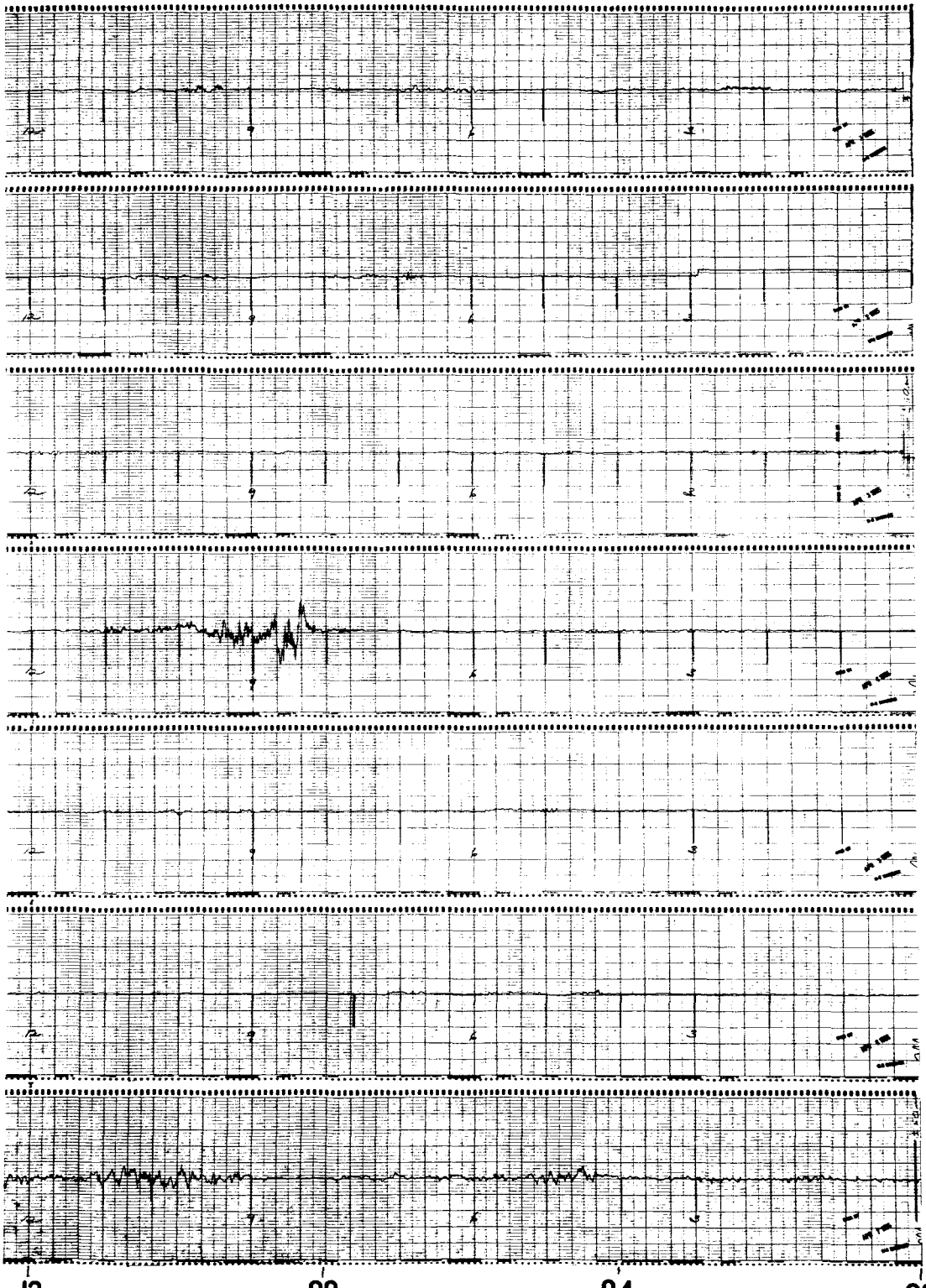
N-S TELLURIC CURRENT

APR 1965 COLLEGE 12



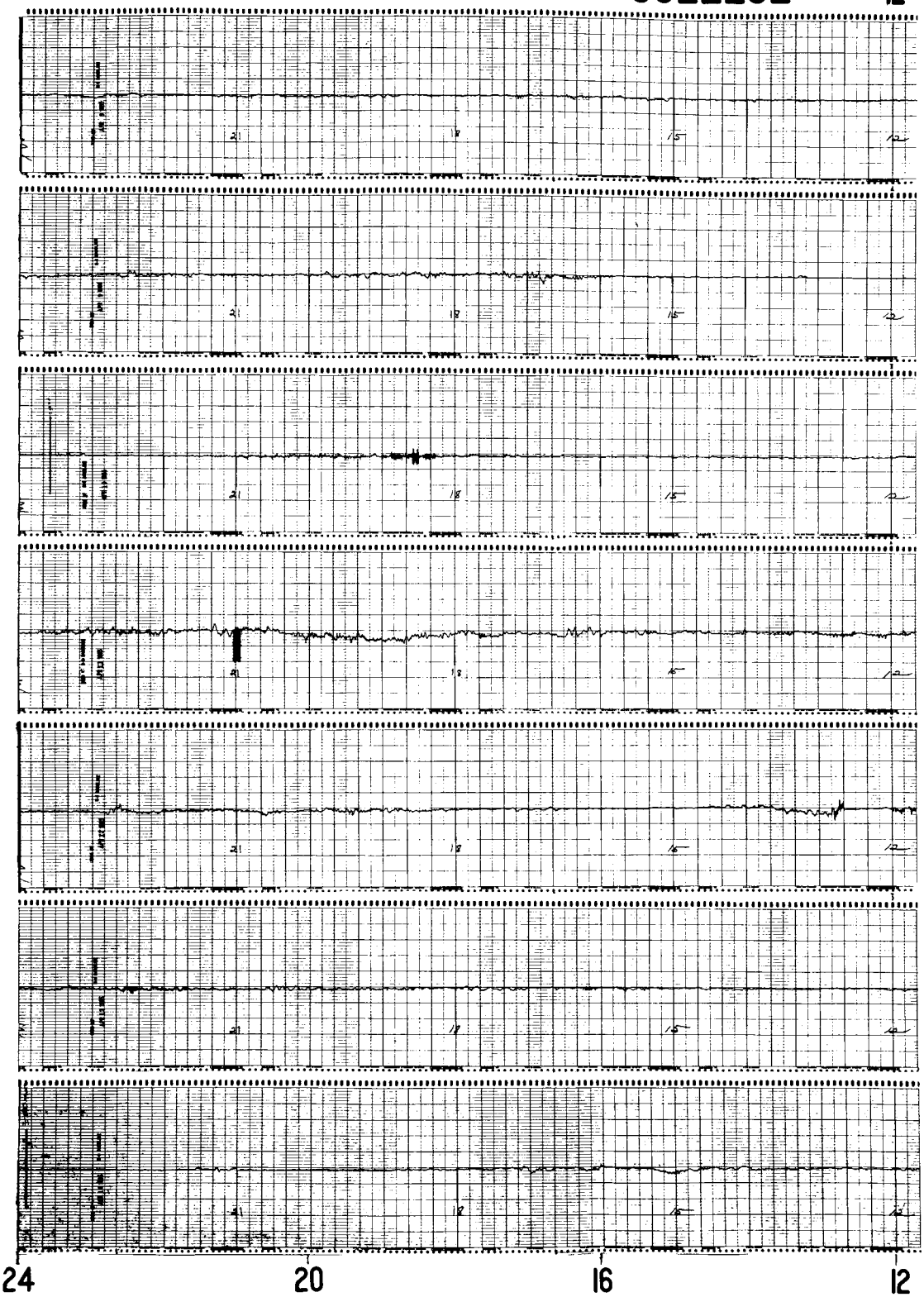
UNIVERSAL TIME

12 ALASKA APR 1965



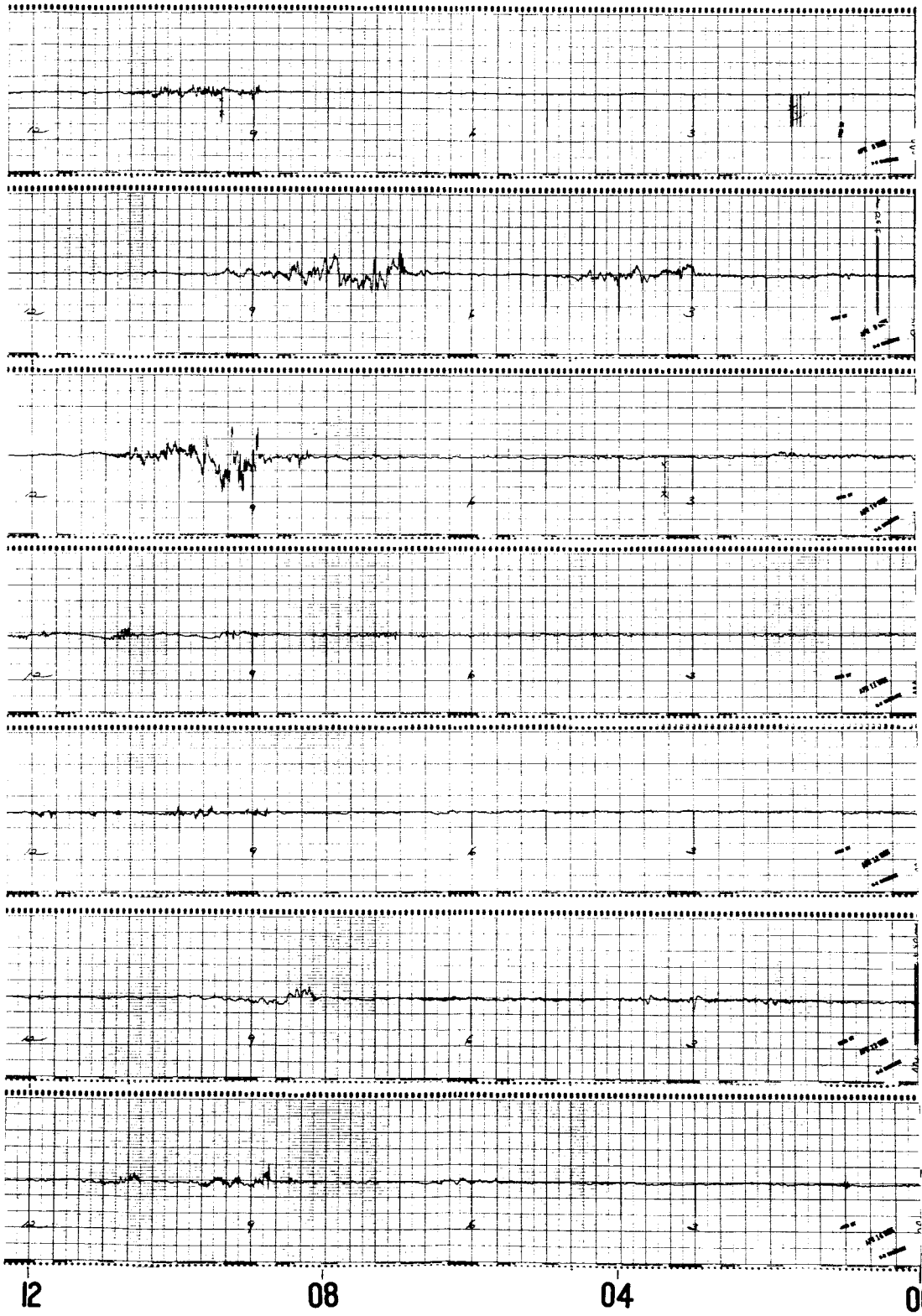
N-S TELLURIC CURRENT

APR 1965 COLLEGE 12



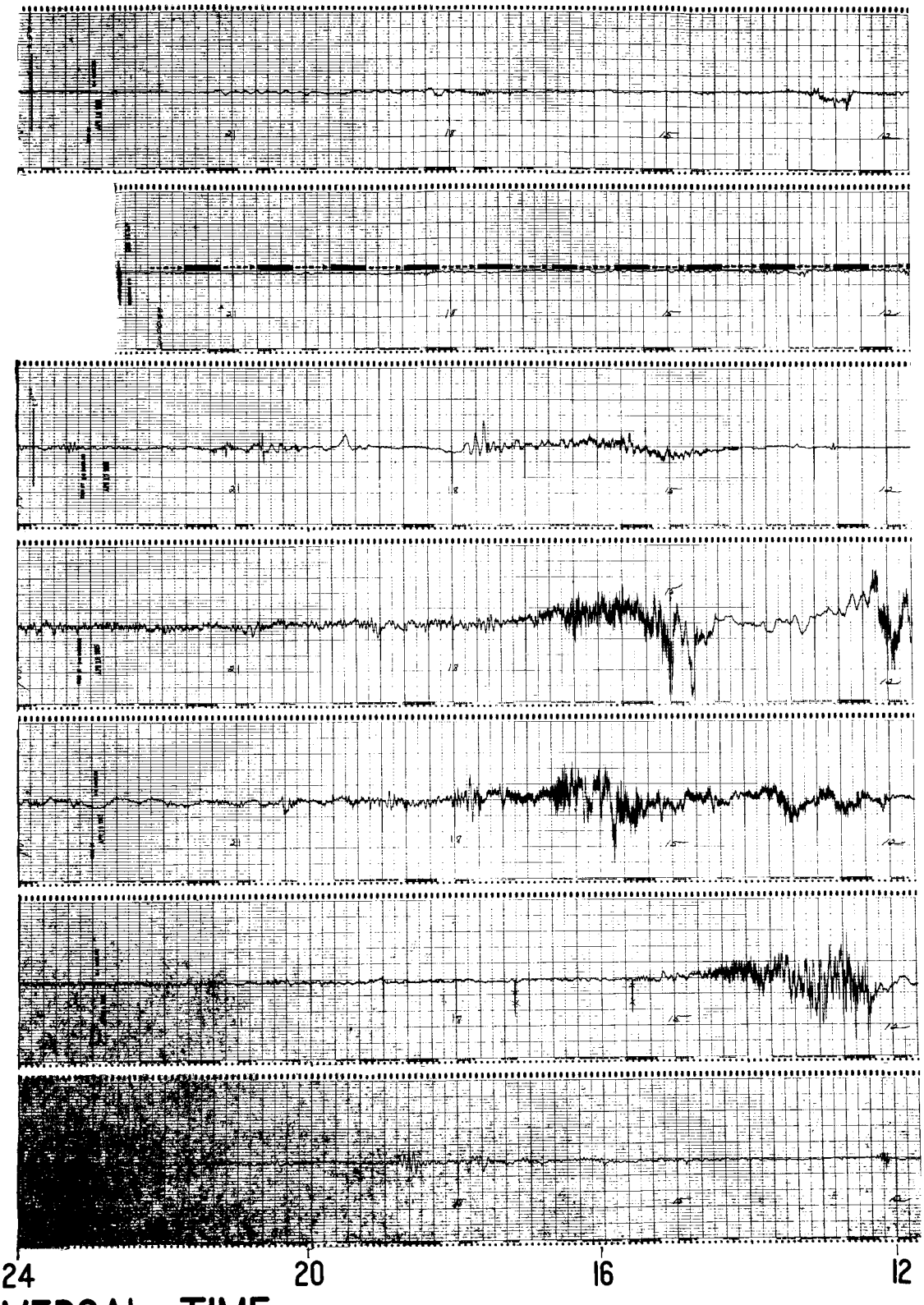
UNIVERSAL TIME

12 ALASKA APR 1965



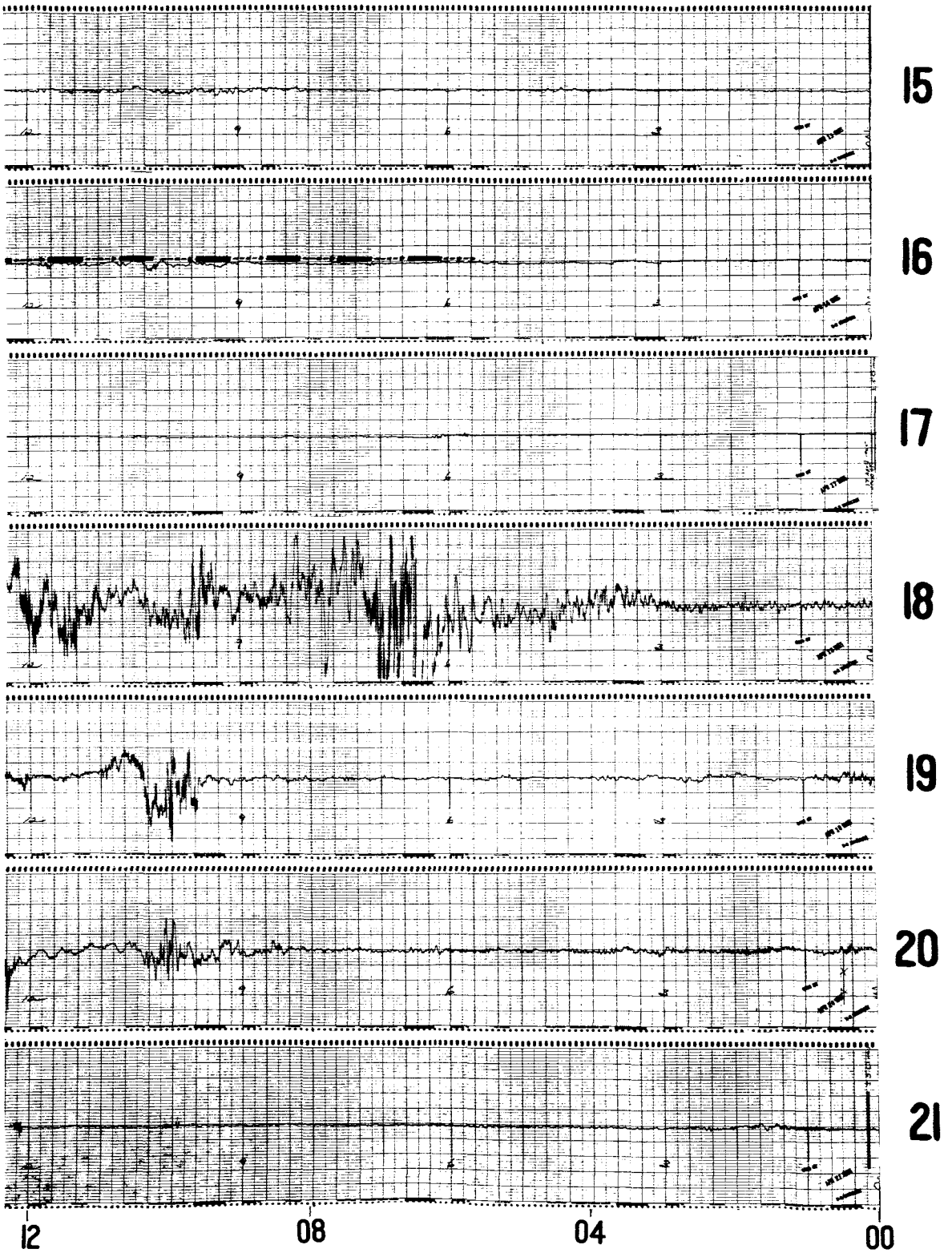
N-S TELLURIC CURRENT

APR 1965 COLLEGE 12



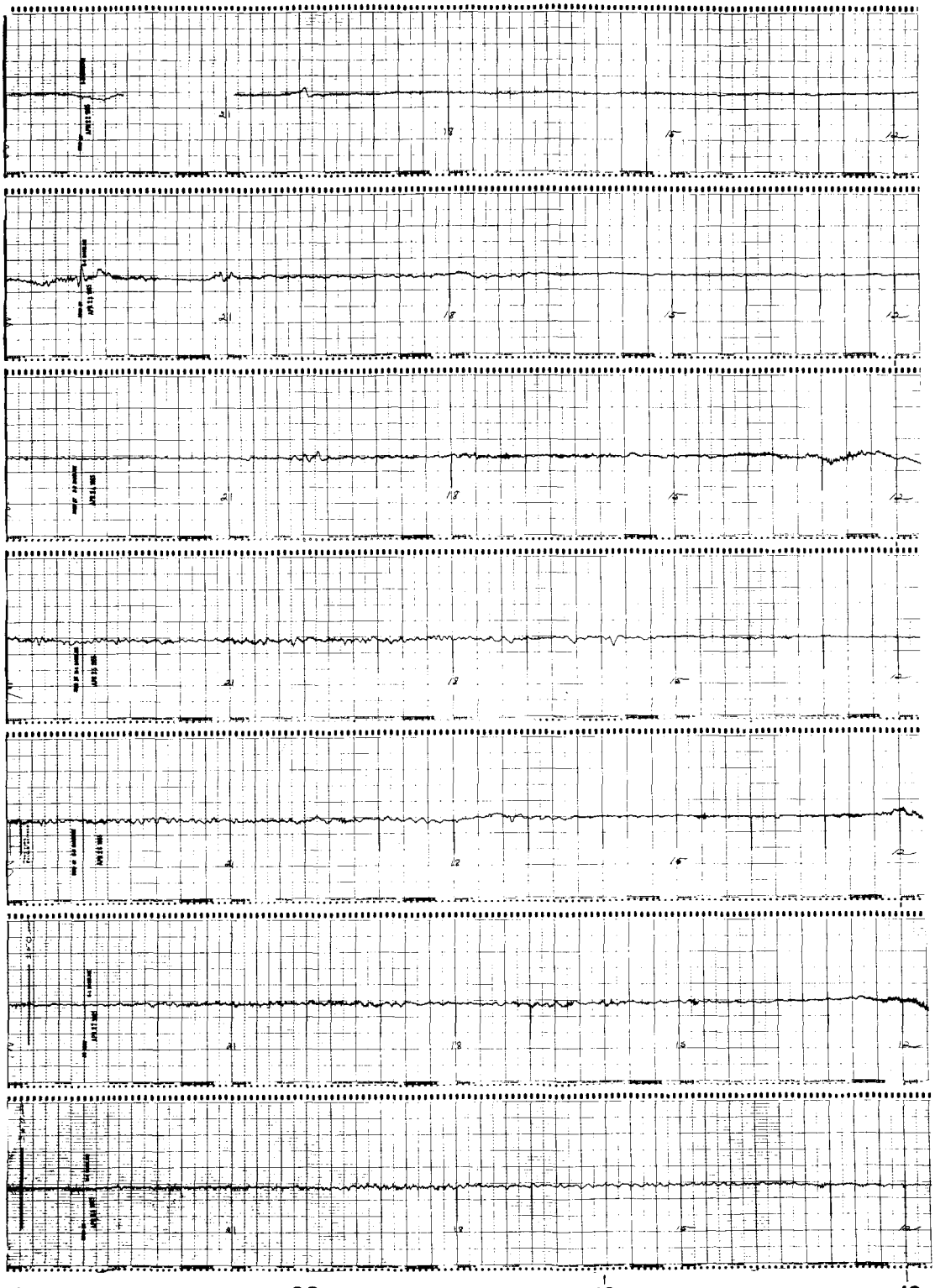
UNIVERSAL TIME

12 ALASKA APR 1965

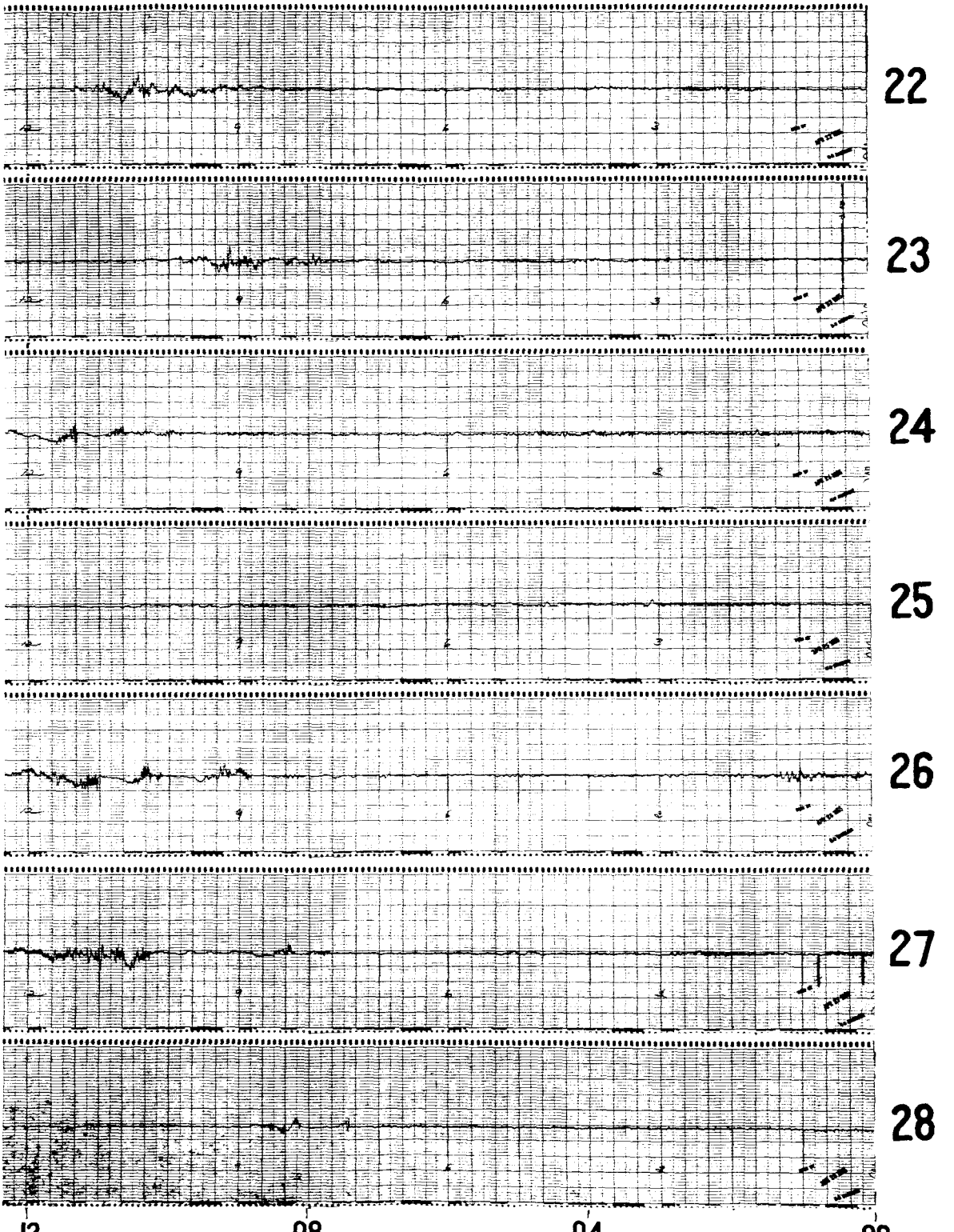


N-S TELLURIC CURRENT

APR 1965 COLLEGE 12

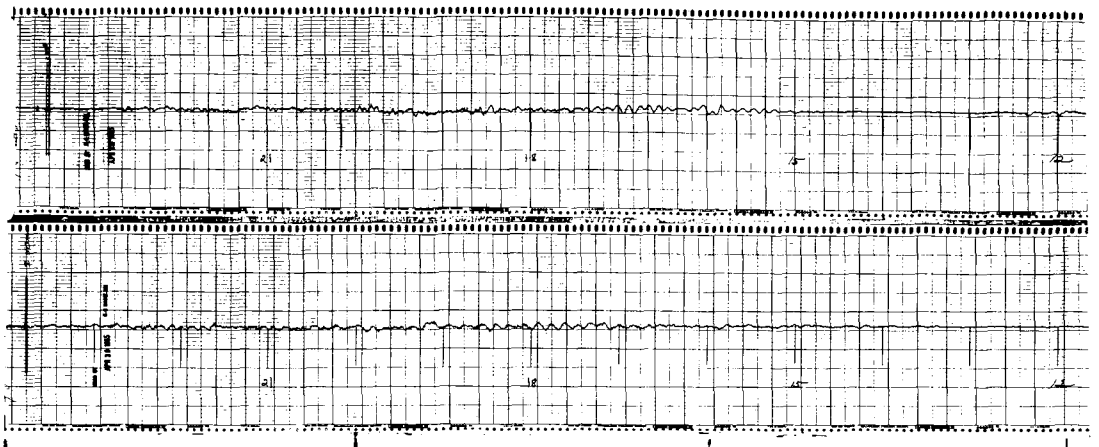


12 ALASKA APR 1965



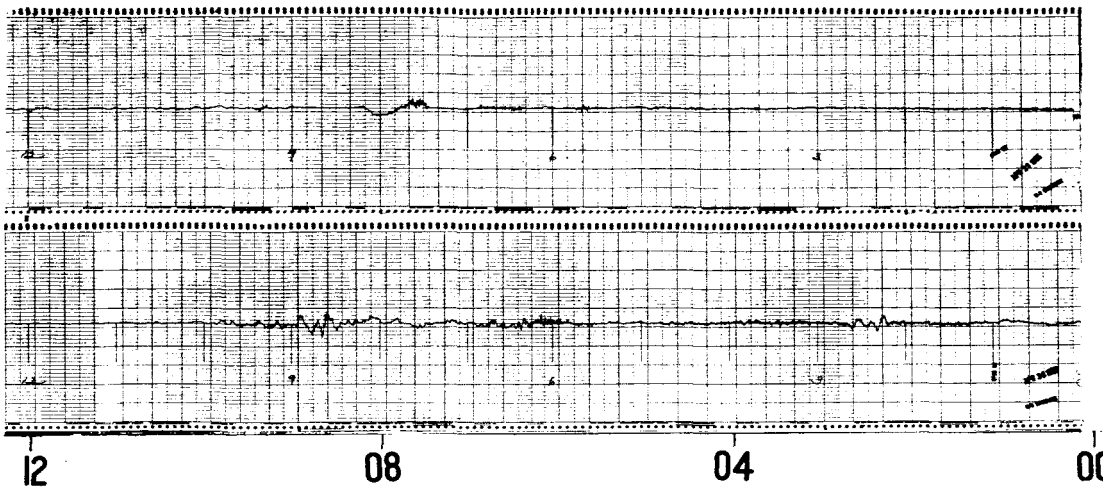
N-S TELLURIC CURRENT

APR 1965 COLLEGE 12



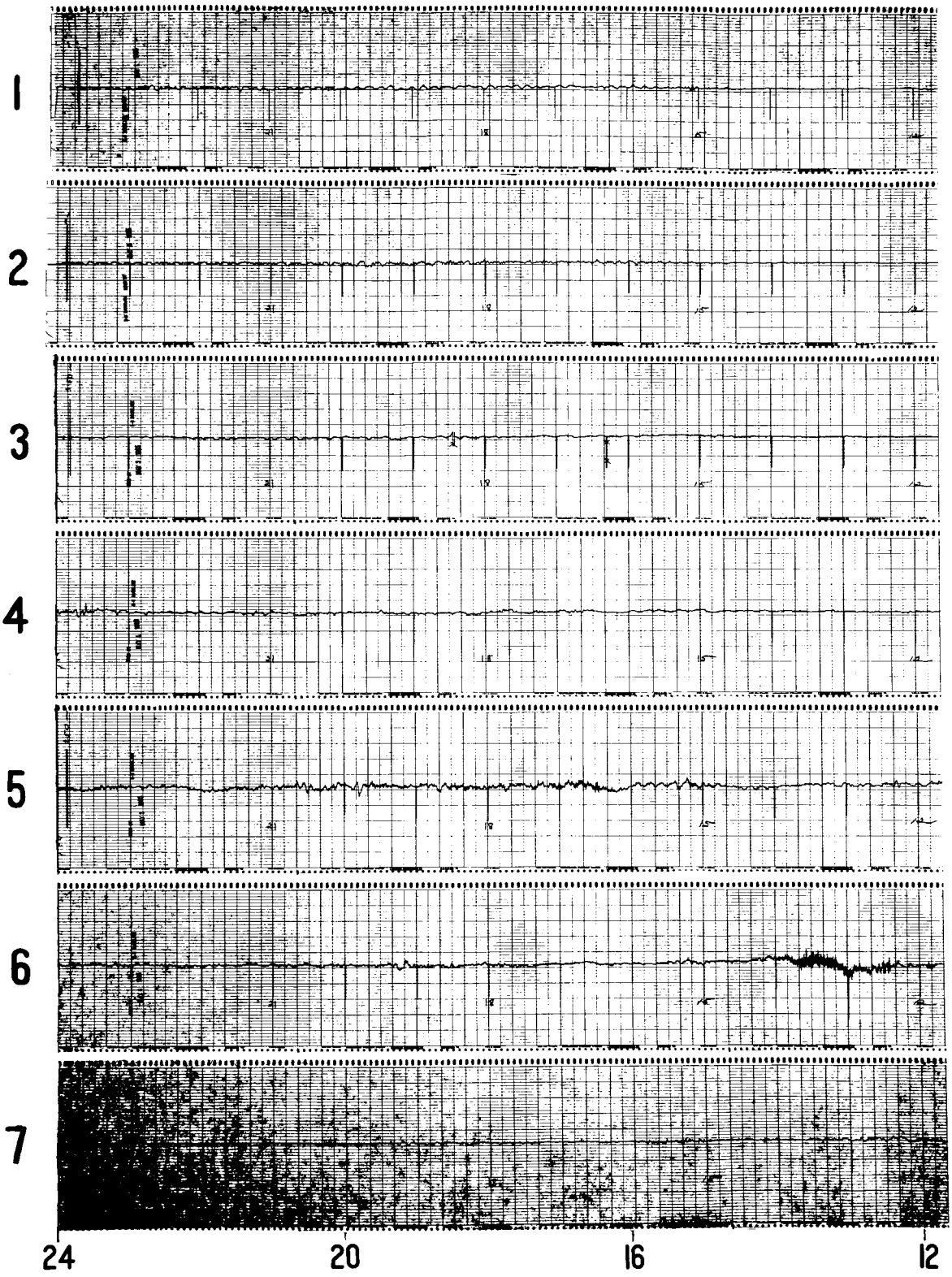
UNIVERSAL TIME

12 ALASKA APR 1965



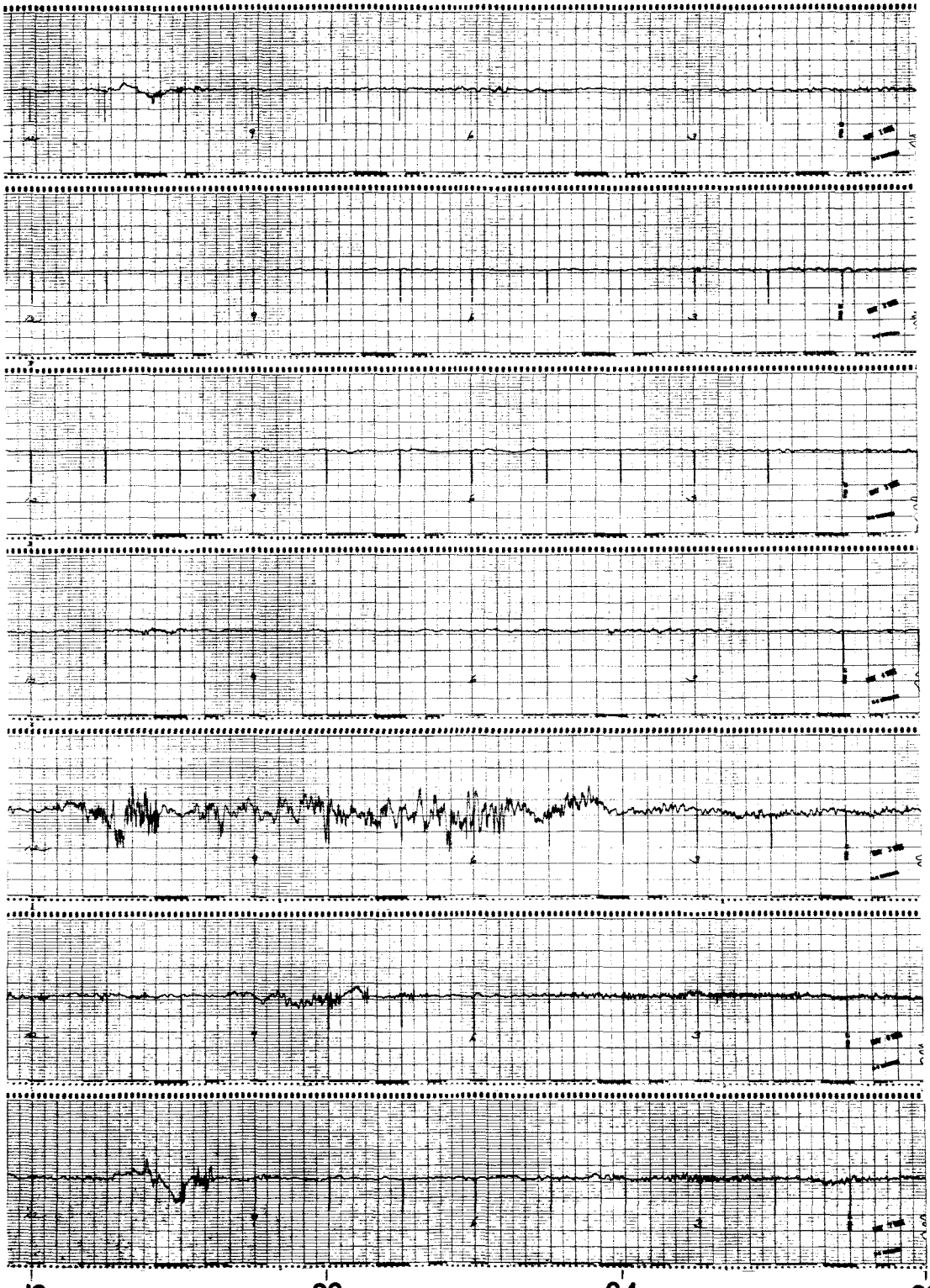
N-S TELLURIC CURRENT

MAY 1965 COLLEGE 12



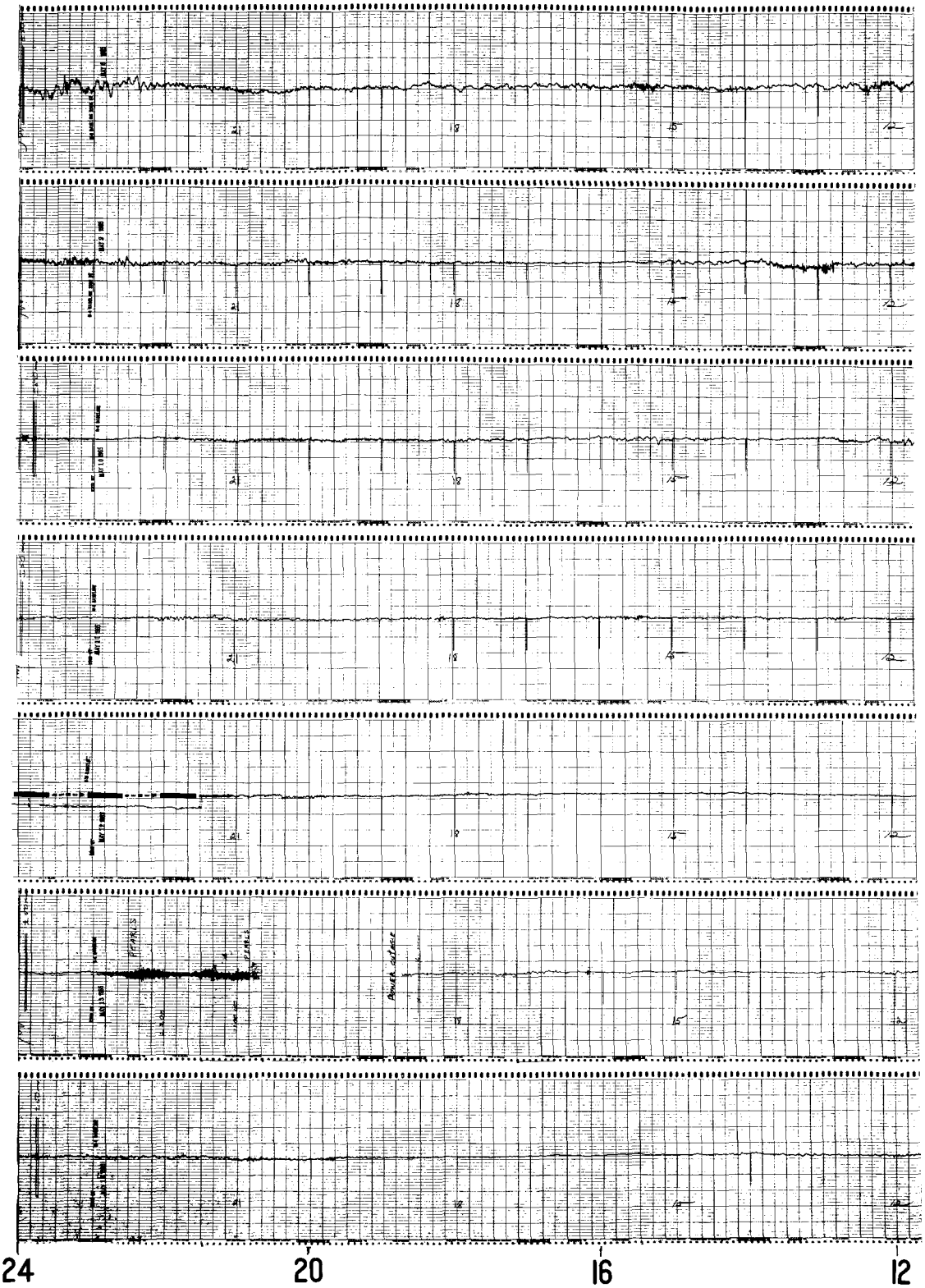
UNIVERSAL TIME

12 ALASKA MAY 1965



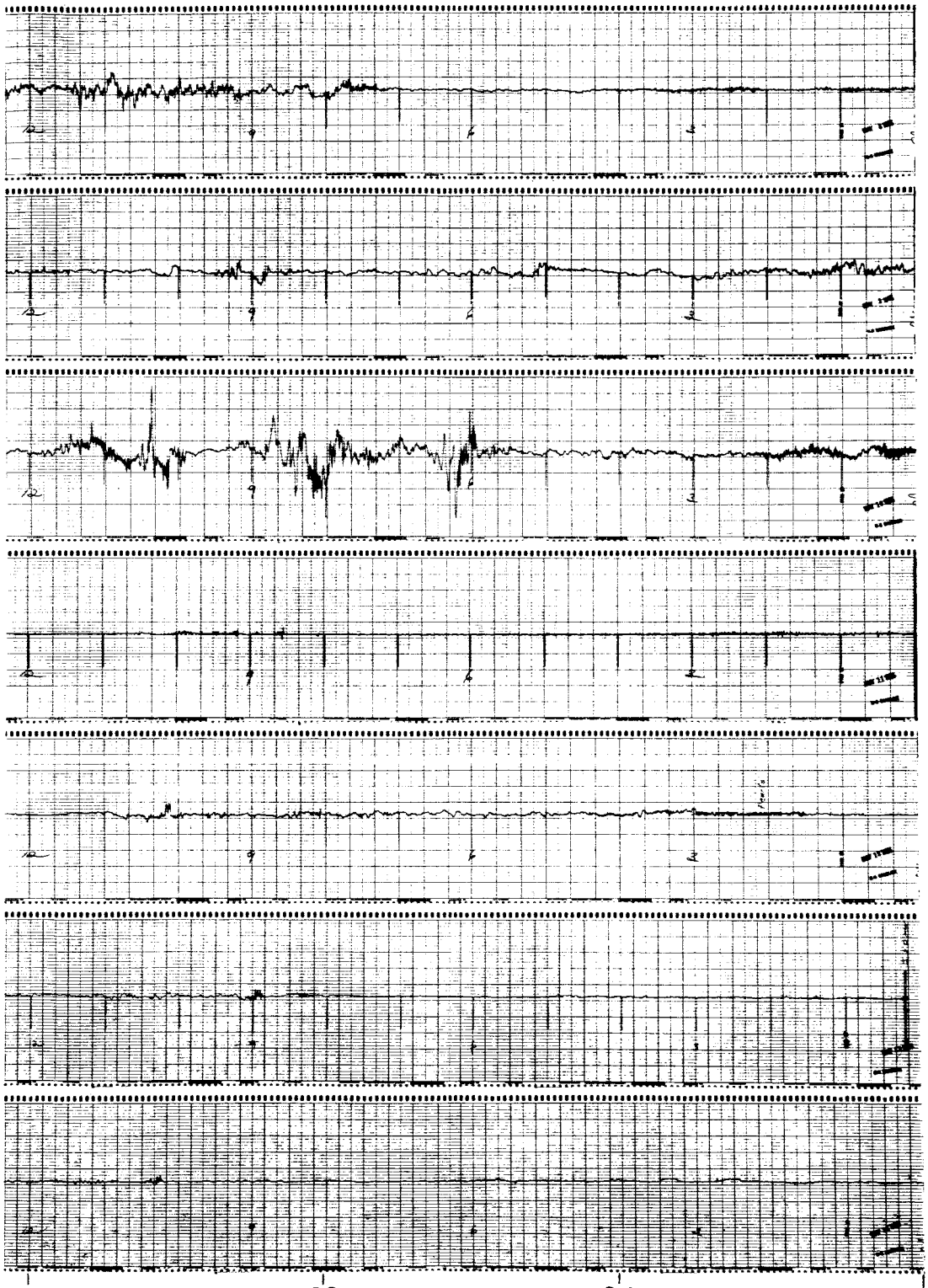
N-S TELLURIC CURRENT

MAY 1965 COLLEGE 12



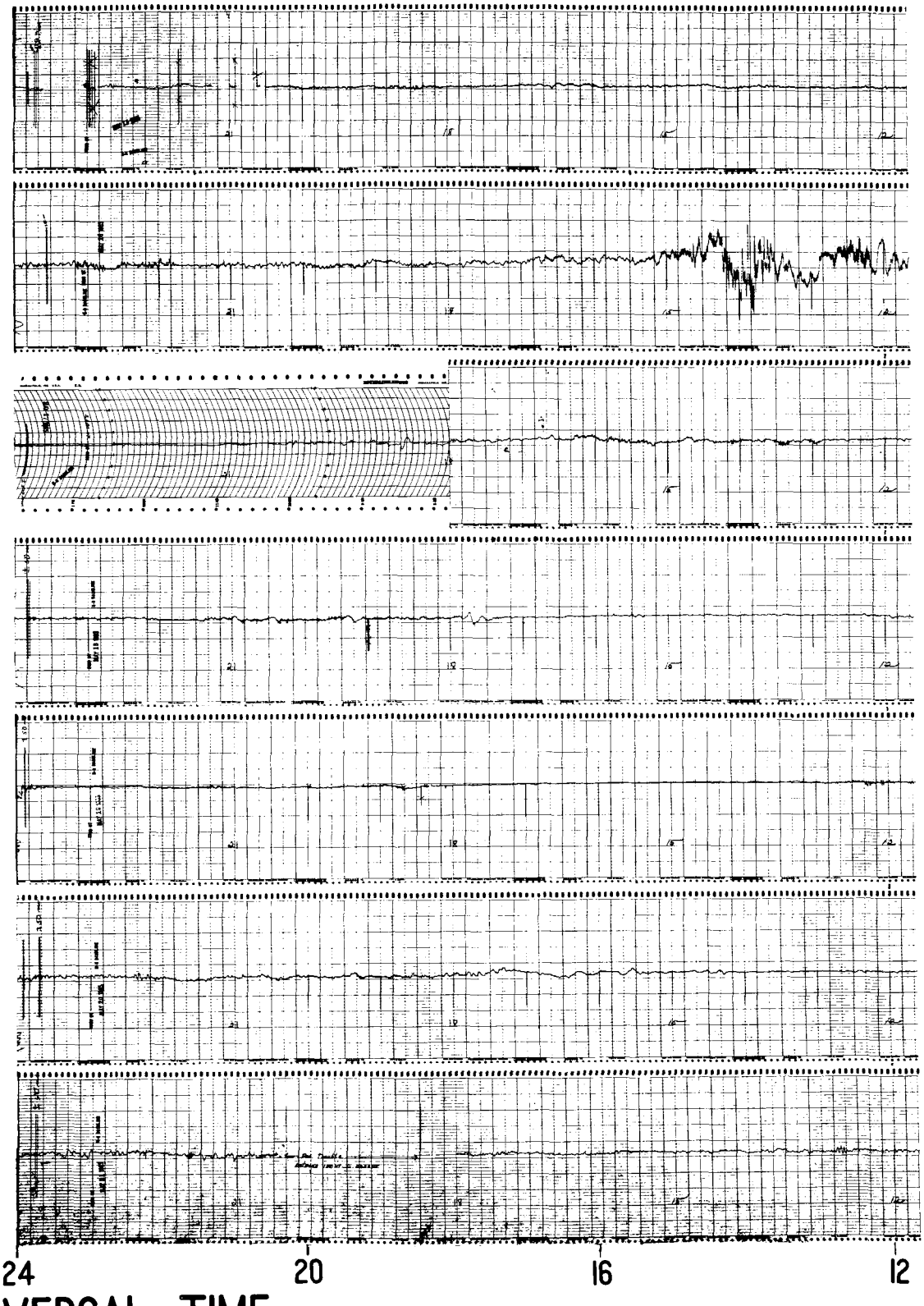
UNIVERSAL TIME

12 ALASKA MAY 1965



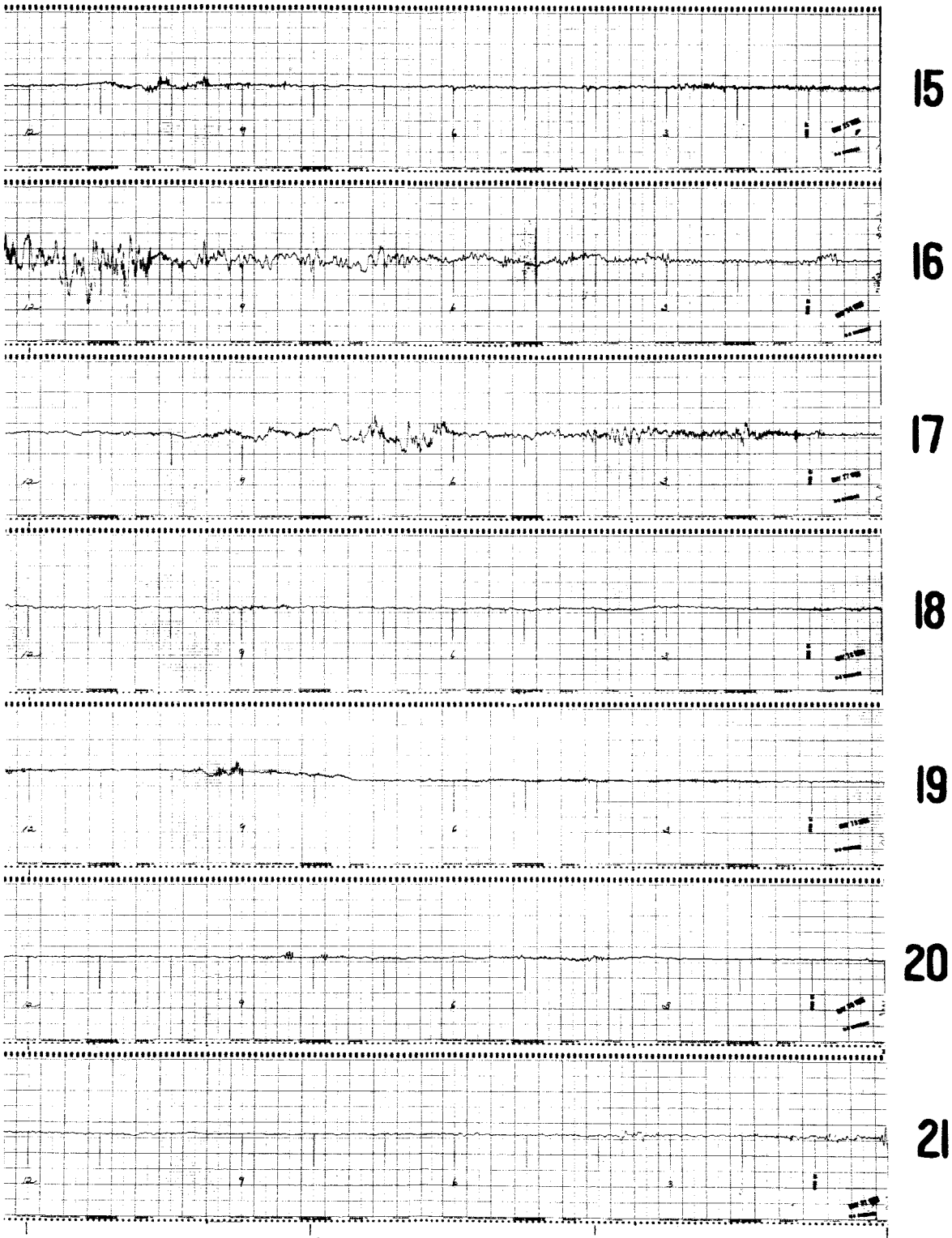
N-S TELLURIC CURRENT

MAY 1965 COLLEGE 12



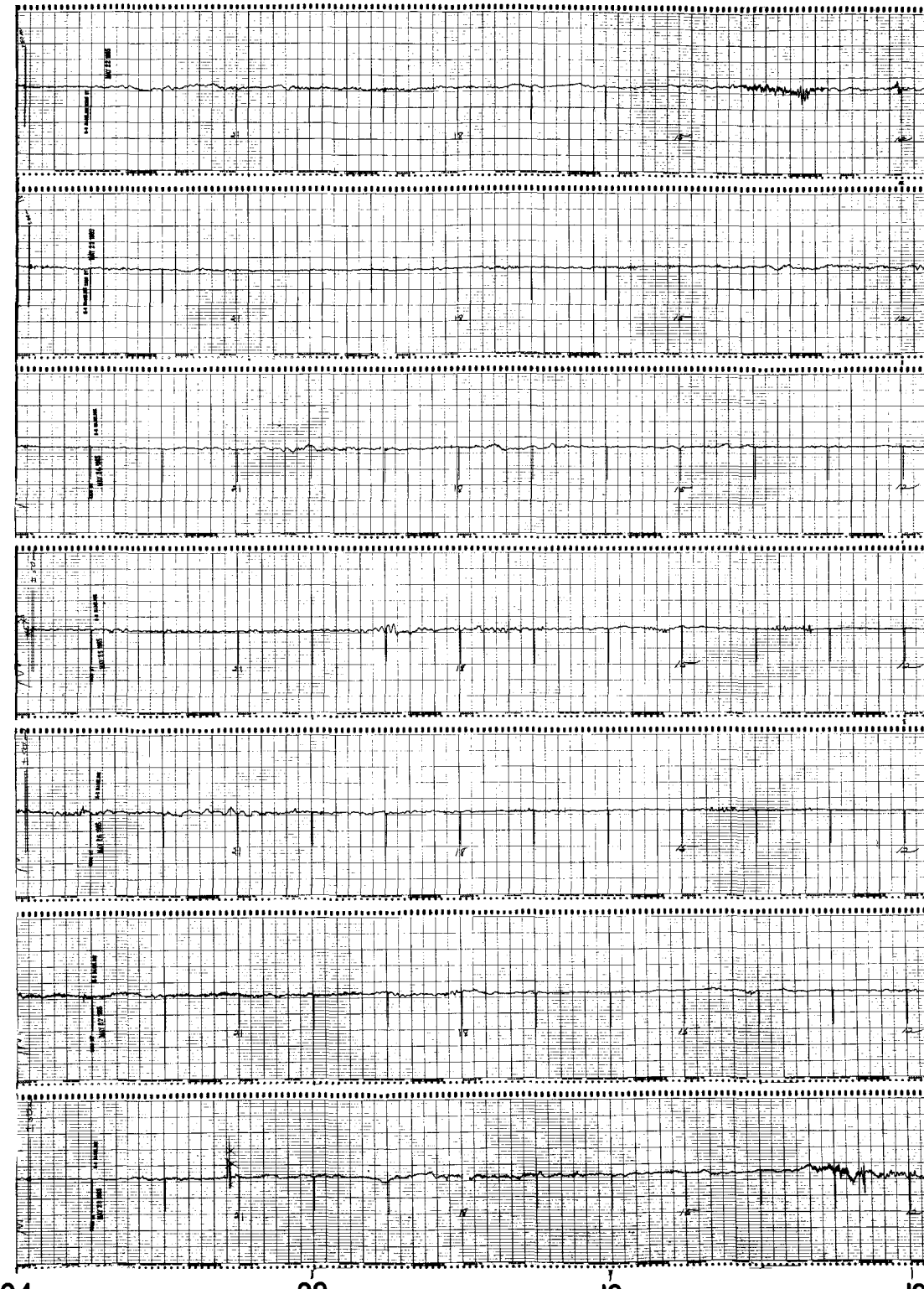
UNIVERSAL TIME

12 ALASKA MAY 1965



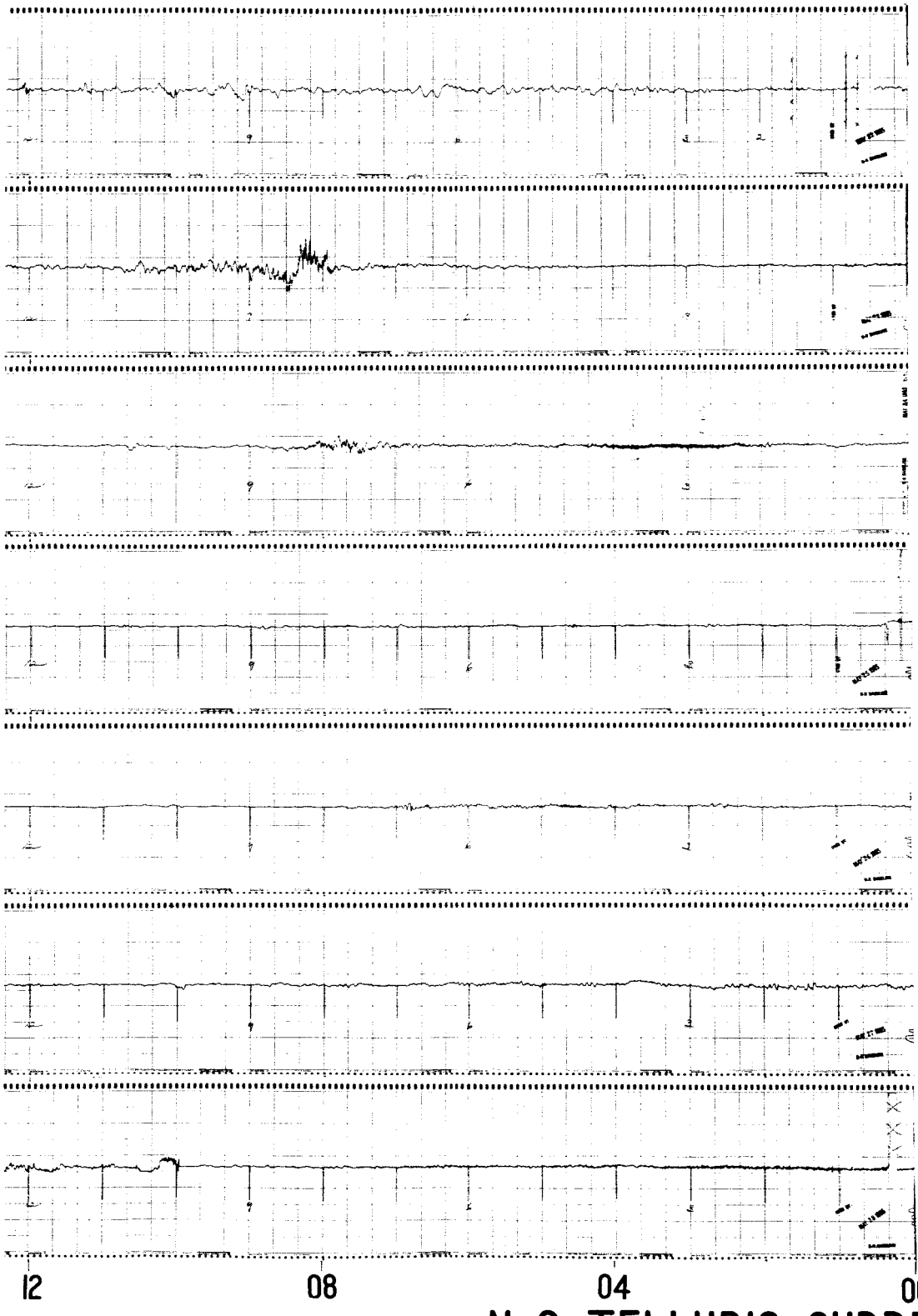
N-S TELLURIC CURRENT

MAY 1965 COLLEGE 12



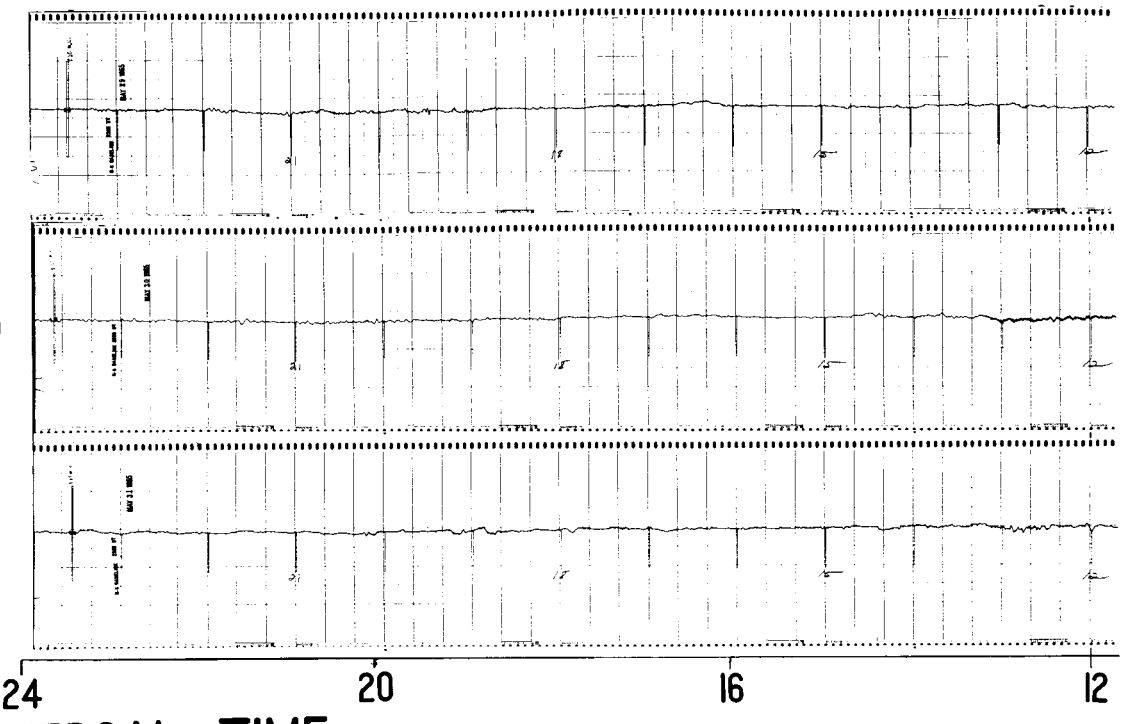
UNIVERSAL TIME

12 ALASKA MAY 1965



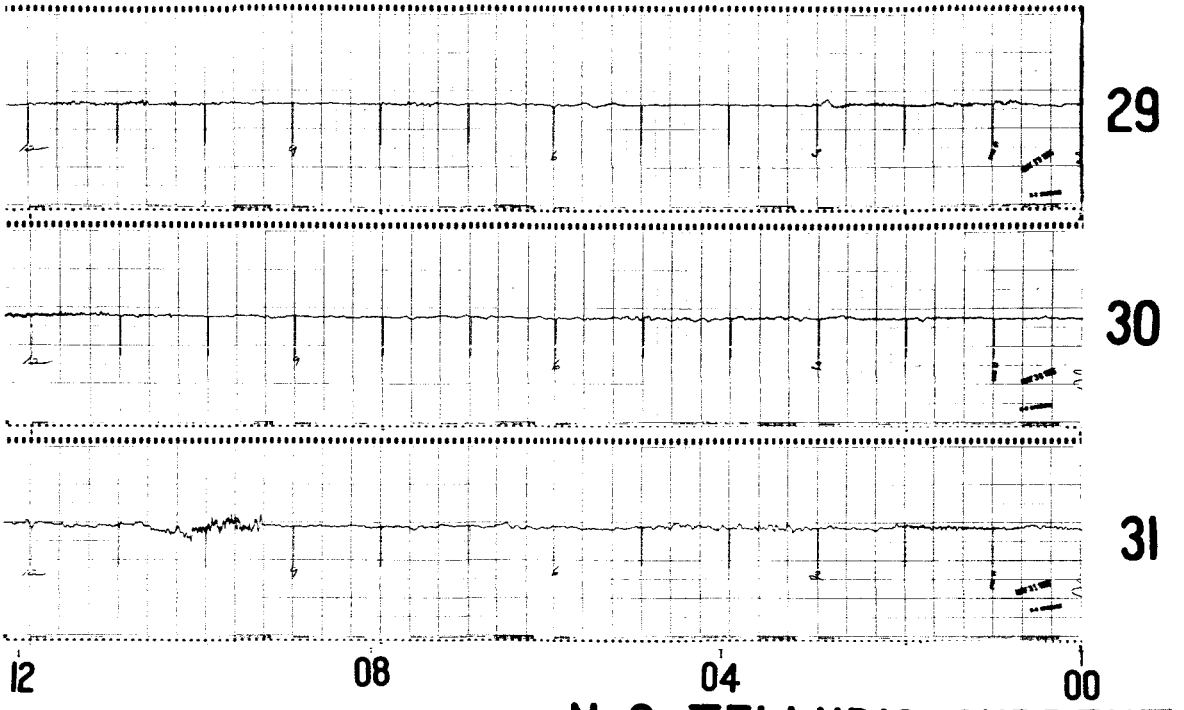
N-S TELLURIC CURRENT

MAY 1965 COLLEGE 12



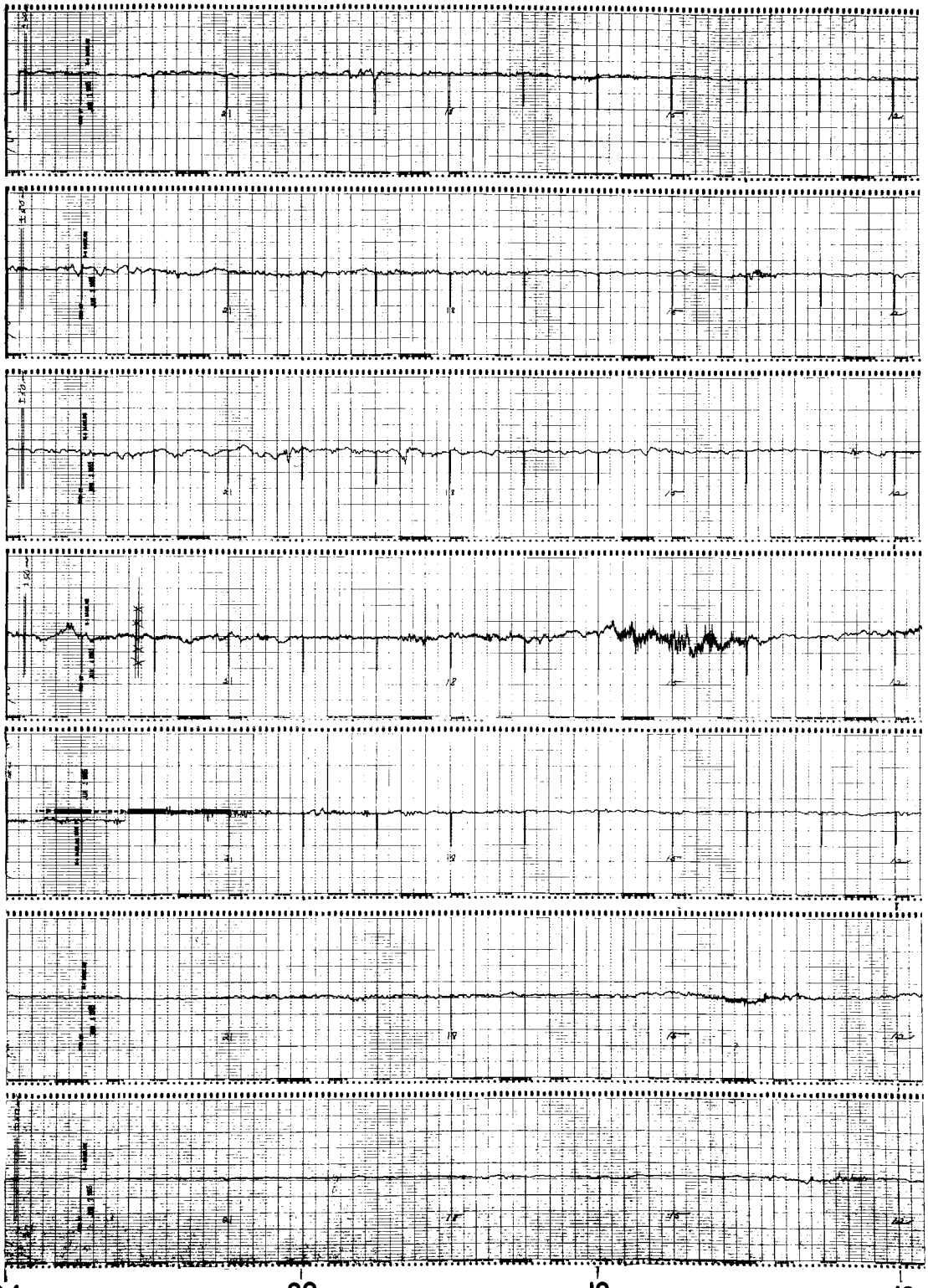
UNIVERSAL TIME

12 ALASKA MAY 1965



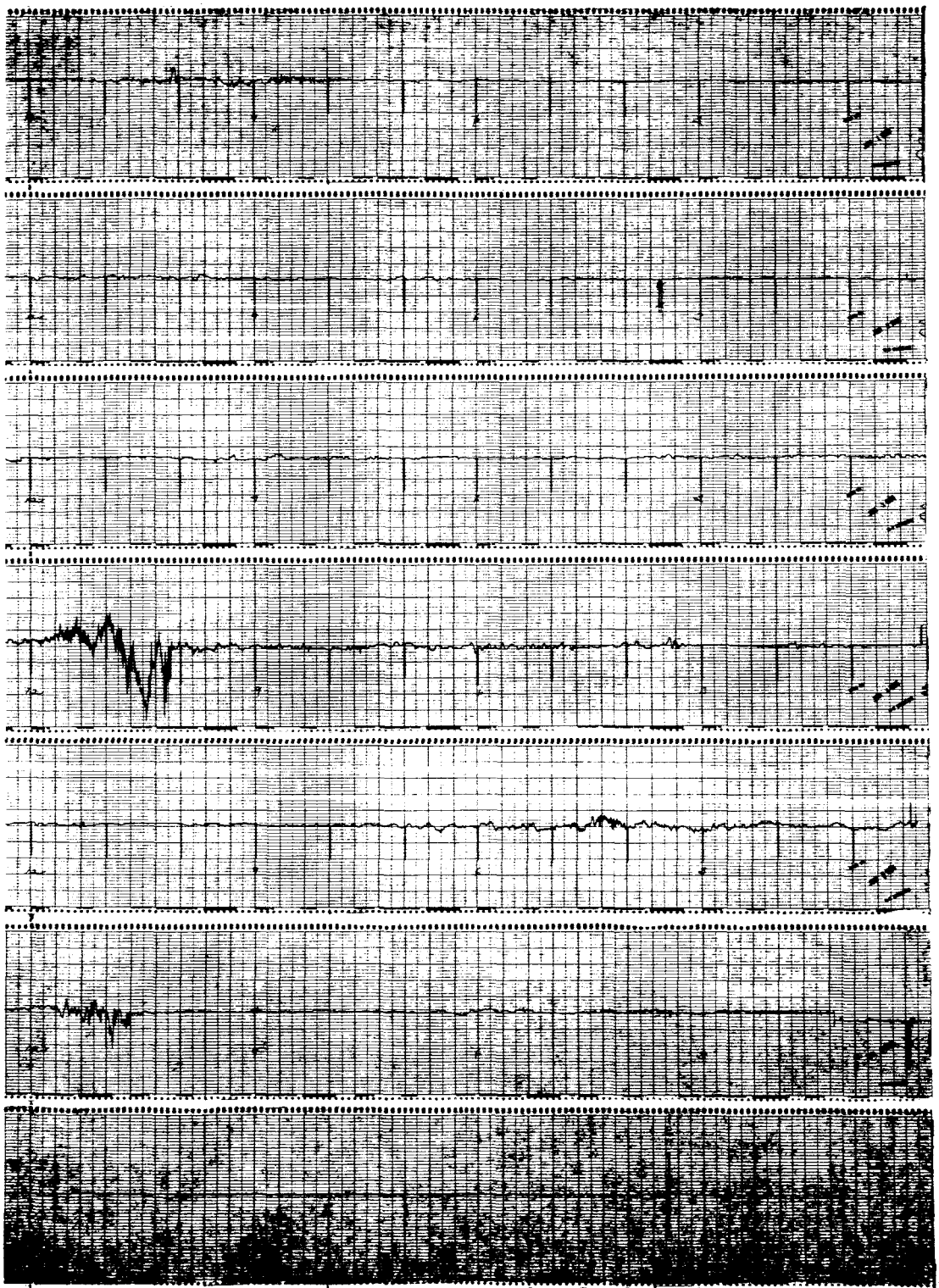
N-S TELLURIC CURRENT

JUN 1965 COLLEGE 12



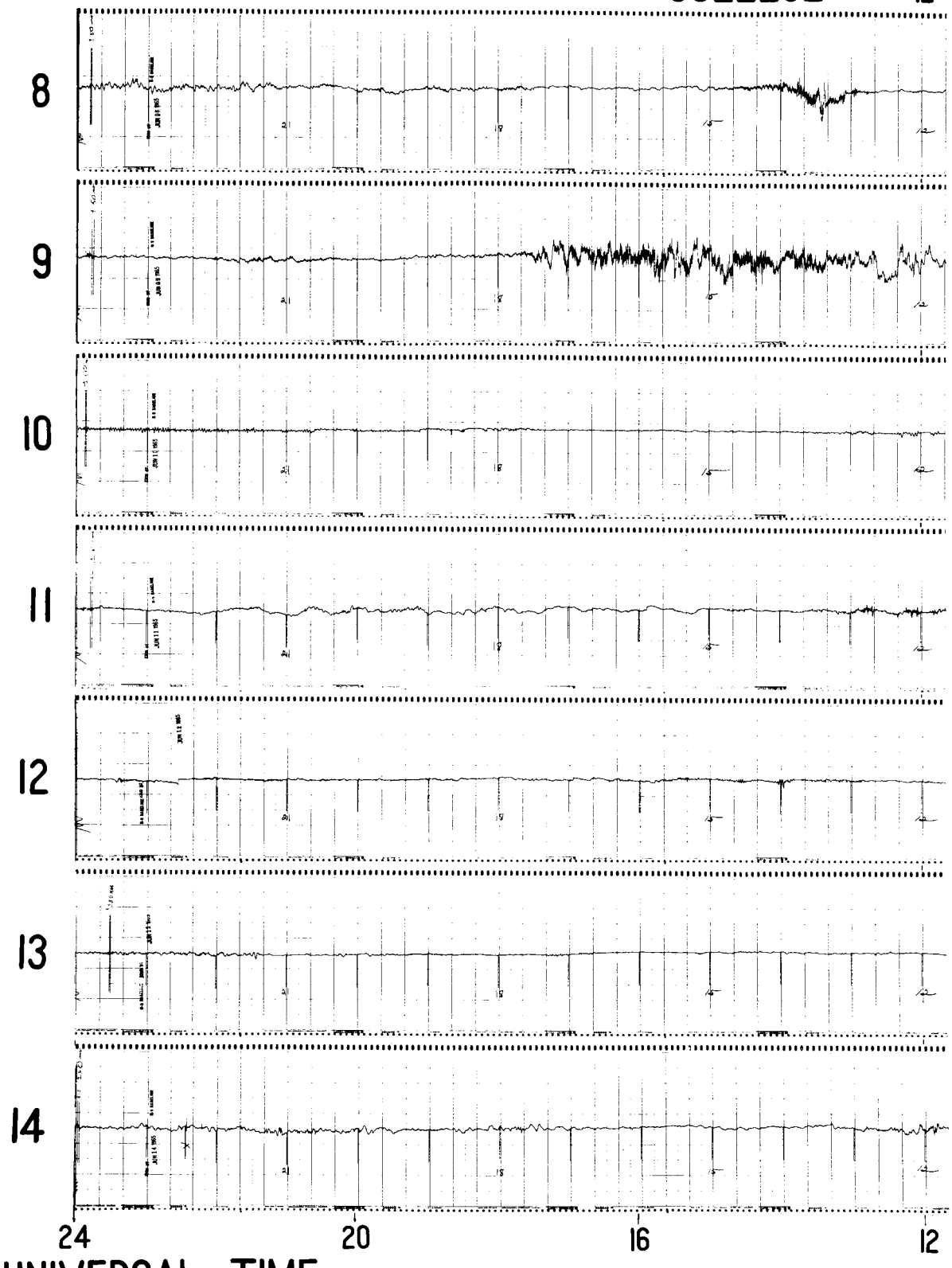
UNIVERSAL TIME

12 ALASKA JUN 1965



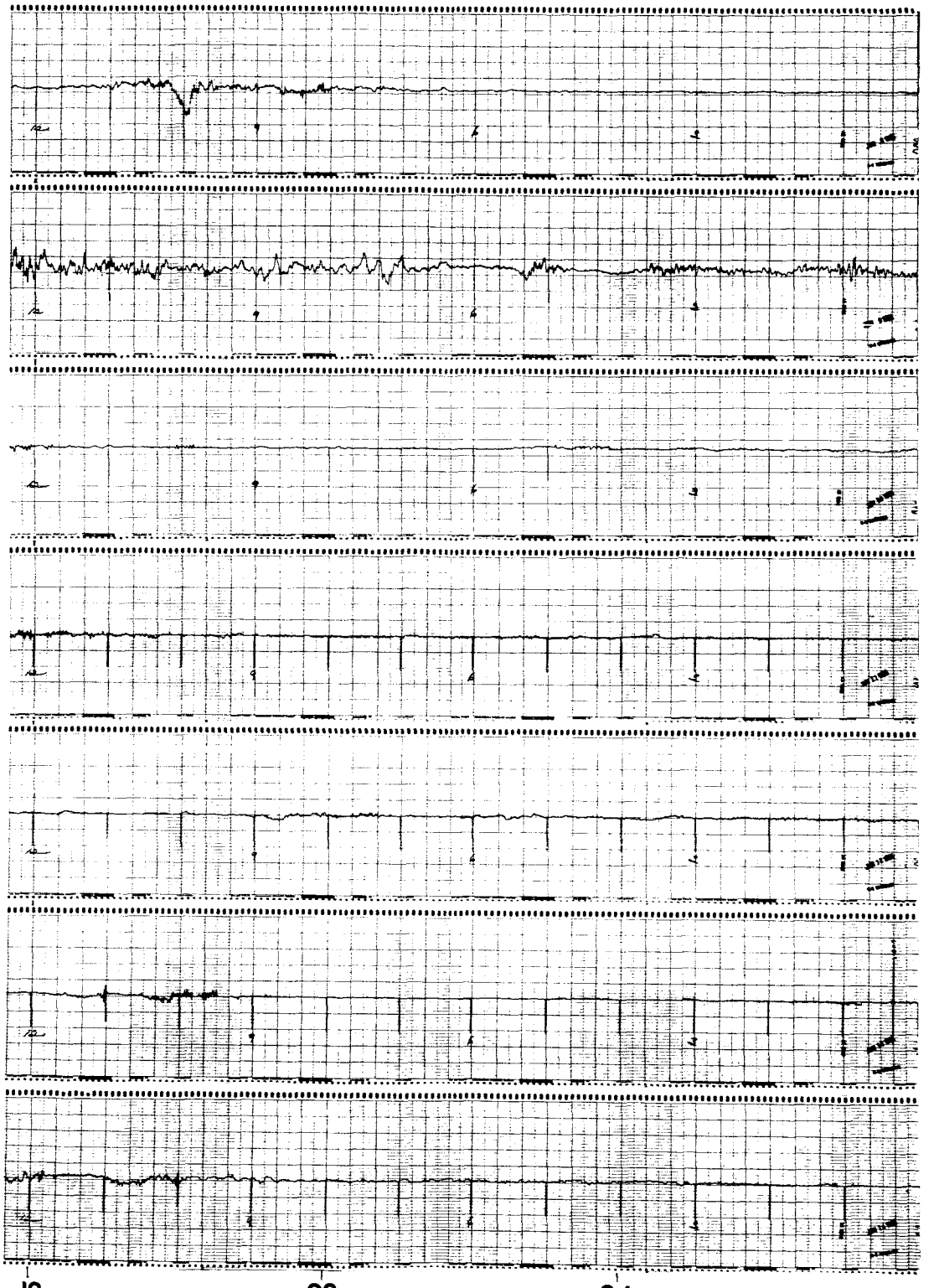
N-S TELLURIC CURRENT

JUN 1965 COLLEGE 12



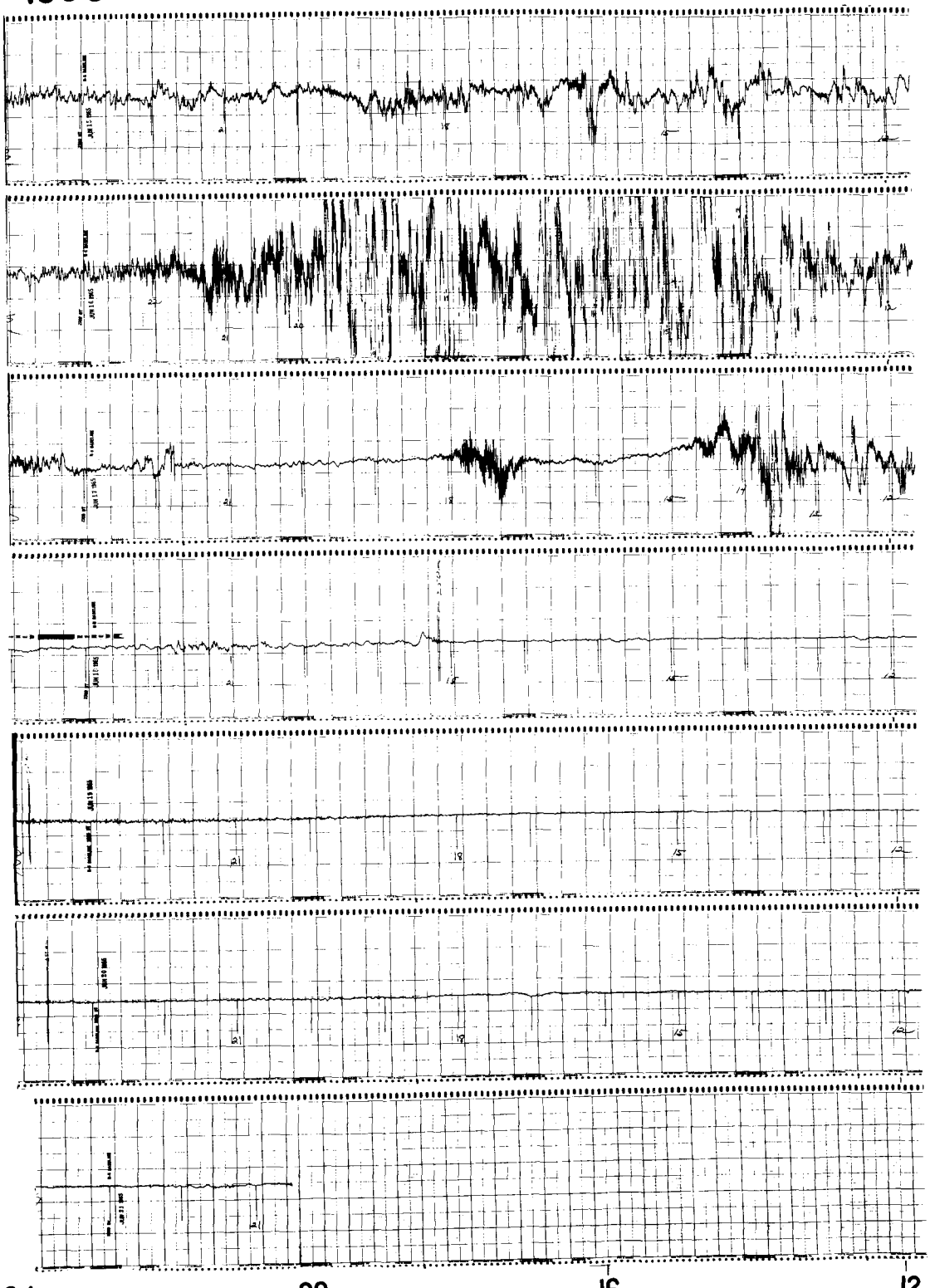
UNIVERSAL TIME

12 ALASKA JUN 1965



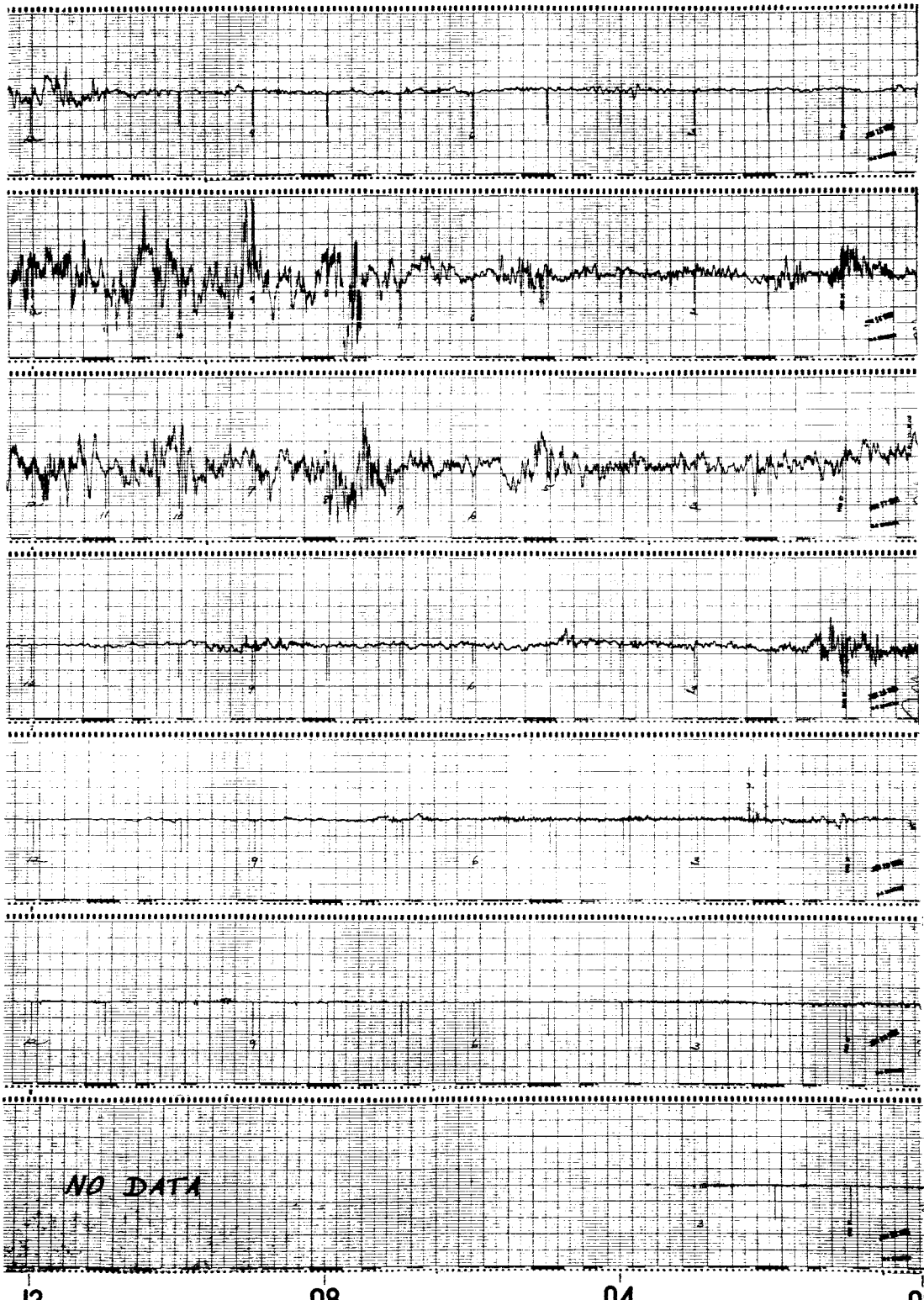
N-S TELLURIC CURRENT

JUN 1965 COLLEGE 12



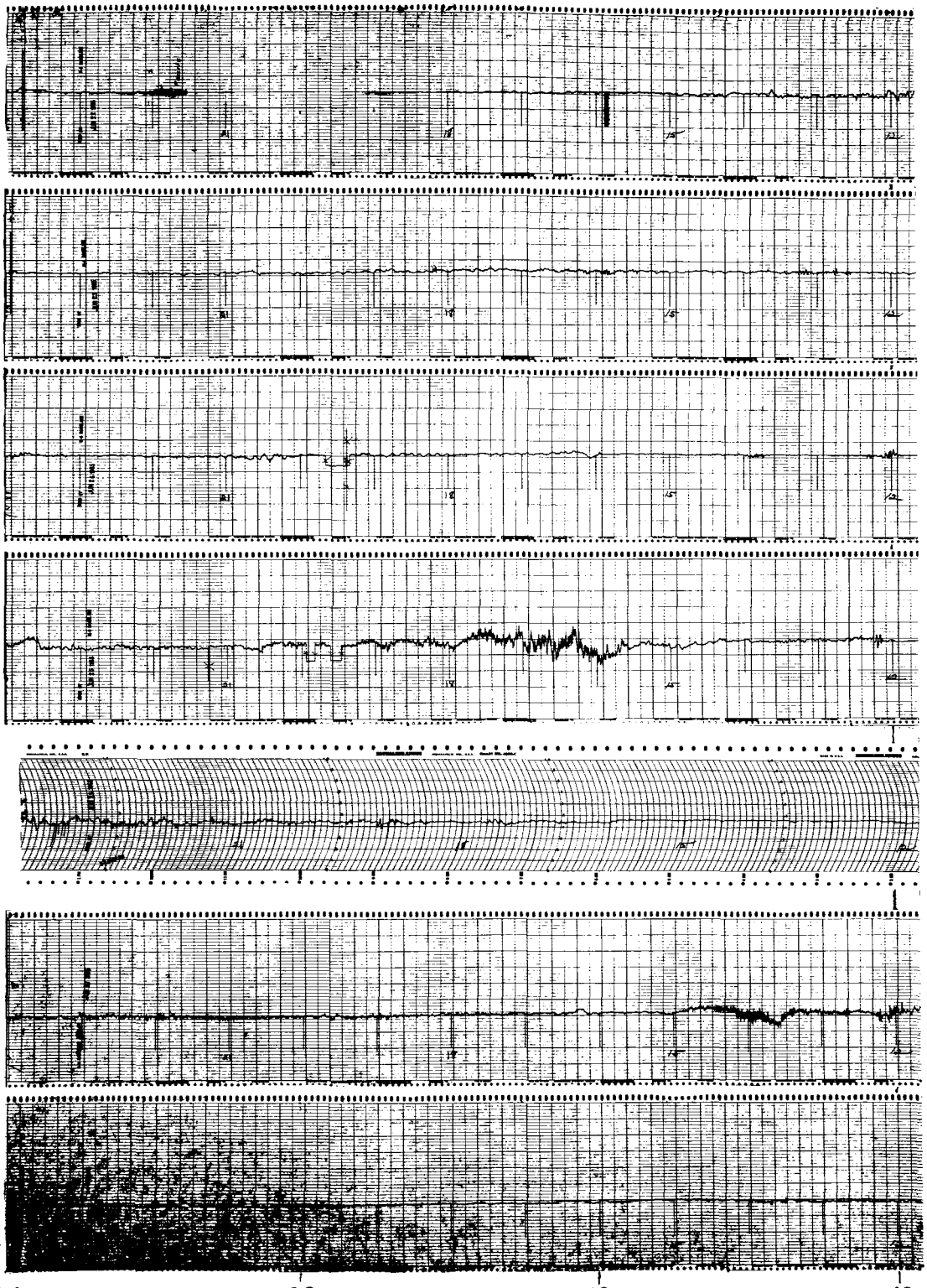
UNIVERSAL TIME

12 ALASKA JUN 1965

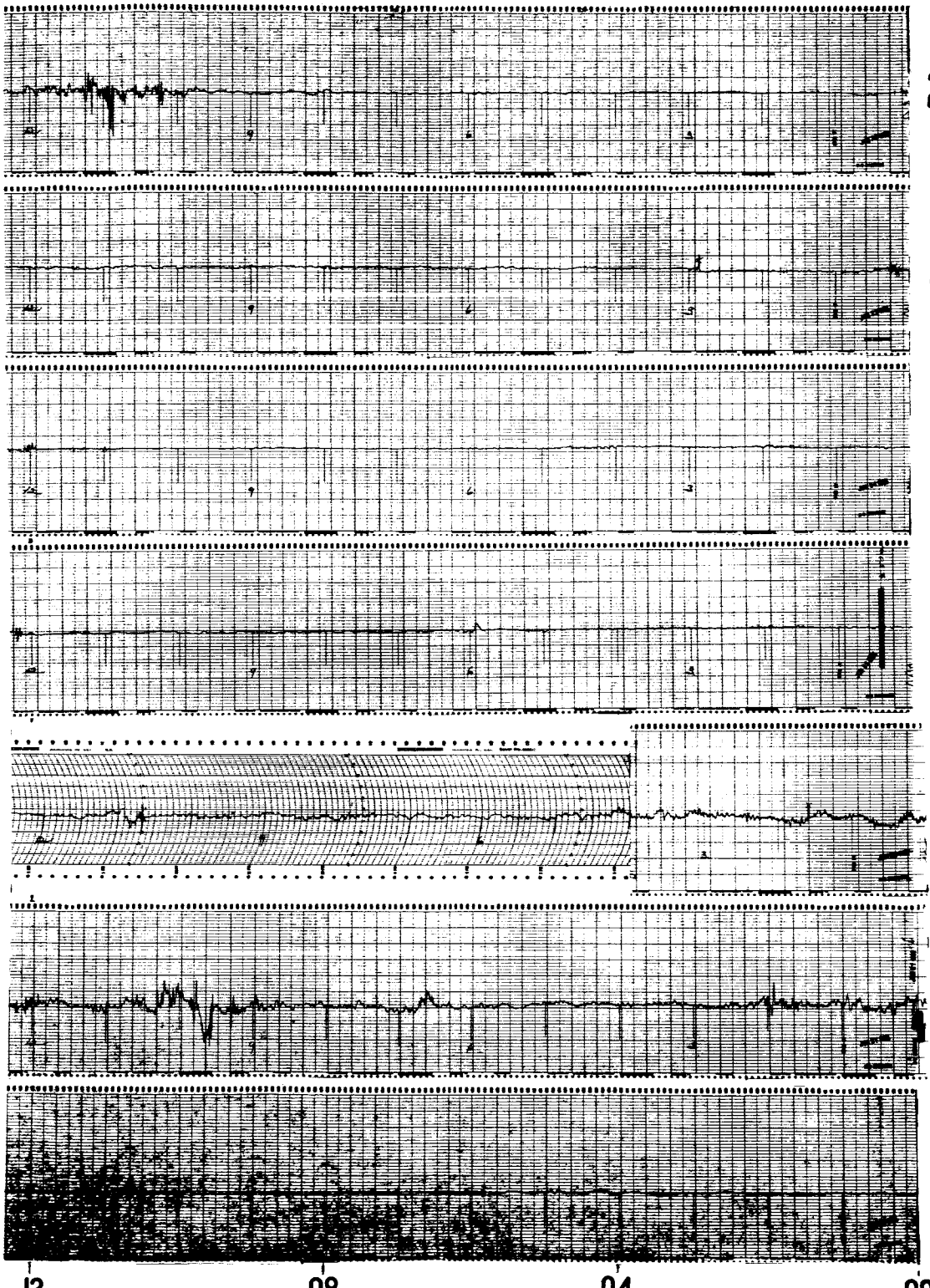


N-S TELLURIC CURRENT

JUN 1965 COLLEGE 12

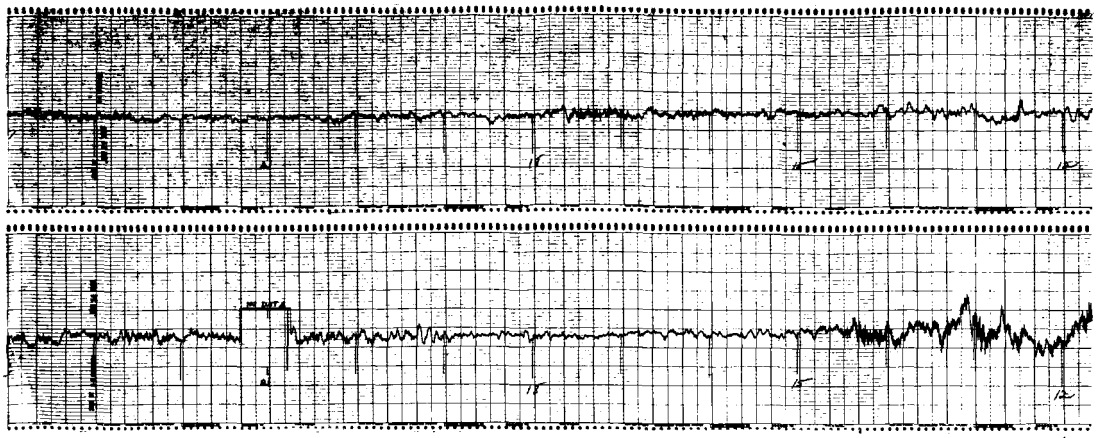


12 ALASKA JUN 1965



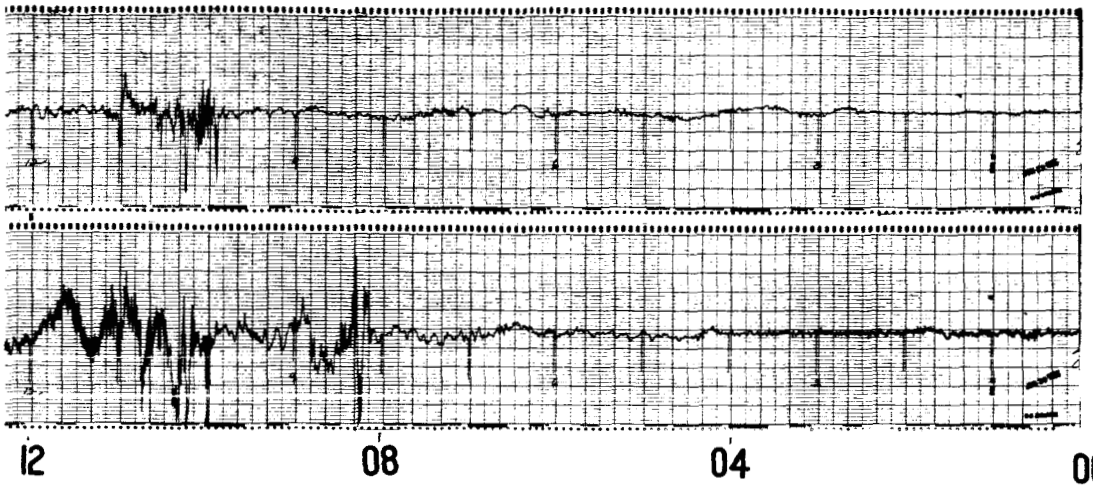
N-S TELLURIC CURRENT

JUN 1965 COLLEGE 12



UNIVERSAL TIME

12 ALASKA JUN 1965



N-S TELLURIC CURRENT

N-S TELLURIC CURRENT AMPLITUDE ACTIVITY - MV/KM

Month: April 1965 — Hour (Universal Time) — Observatory: College .

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg
1	30	20	20	20	20	30	50	30	20	50	30	20	10	40	69	30	20	40	30	50	20	30	20	20	30
2	10	10	10	10	20	20	50	30	20	30	30	10	10	10	10	10	10	10	40	30	10	10	30	30	19
3	20	20	20	20	30	20	10	10	20	10	20	30	10	10	30	10	20	20	30	10	20	20	10	10	18
4	10	10	20	30	20	20	20	30	400	180	70	30	20	20	50	80	30	20	20	30	20	10	10	20	49
5	10	10	10	20	30	30	10	10	20	40	40	20	30	20	40	20	20	20	20	20	20	20	20	30	22
6	10	10	10	10	50	20	20	20	10	10	10	20	20	30	60	40	50	30	30	30	30	50	50	30	27
7	30	50	50	30	120	70	40	50	20	150	220	110	110	110	80	120	40	40	20	20	20	30	30	20	66
8	10	10	10	10	10	10	10	10	50	100	70	20	10	20	10	30	20	20	20	20	20	10	40	30	24
9	40	30	80	120	100	20	140	260	180	60	30	20	10	20	10	20	70	40	50	50	20	30	50	30	62
10	30	50	30	30	30	20	20	40	290	410	170	30	10	10	10	10	10	20	60	40	40	20	10	20	59
11	20	30	20	20	20	20	20	60	30	60	80	50	50	30	40	50	70	60	80	80	110	90	60	50	50
12	30	20	20	20	30	20	20	20	60	90	60	50	130	70	20	20	30	30	30	50	40	20	80	20	41
13	20	50	50	80	20	30	40	20	120	40	20	10	20	10	20	40	30	40	30	20	40	30	50	40	36
14	50	20	20	20	20	40	50	20	150	70	80	30	10	10	50	50	50	40	10	10	10	30	10	10	36
15	20	10	10	20	30	20	10	20	40	50	40	40	150	50	20	20	20	50	60	40	20	40	20	20	34
16	20	20	10	20	20	20	10	20	20	40	80	40	30	50	20	30	20	30	30	20	20	20	10	10	25
17	10	10	10	10	10	30	30	10	10	10	20	10	40	30	100	180	100	230	50	110	200	100	30	70	59
18	80	150	90	240	350	520	>>1070	>970	630	650	310	550	490	130	630	610	330	120	110	140	120	80	70	100	356
19	90	60	60	40	20	40	30	30	60	670	530	70	210	280	190	520	430	300	130	100	120	50	70	70	174
20	79	59	50	69	40	40	69	40	119	337	406	99	673	416	149	79	30	30	30	50	40	59	50	50	128
21	40	50	40	20	20	30	20	10	20	40	30	10	109	10	40	40	50	109	149	20	40	20	40	30	41
22	20	40	40	30	20	30	30	20	50	99	198	50	10	10	20	20	20	20	20	59	30	59	40	40	41
23	20	10	30	30	30	30	30	89	99	178	30	10	10	20	20	20	20	50	30	30	40	59	109	129	47
24	49	49	29	59	49	29	20	20	29	39	69	127	88	59	39	39	39	49	29	69	39	20	10	10	44
25	20	29	29	59	39	29	29	29	29	29	29	20	10	20	29	59	49	39	59	59	59	39	49	69	38
26	78	108	20	20	20	20	29	20	88	118	137	196	59	29	49	20	29	59	49	59	39	49	39	49	58
27	39	39	49	20	29	29	20	39	88	29	176	98	50	30	50	50	50	30	40	50	40	40	30	20	47
28	30	20	30	20	20	20	20	90	100	10	10	20	30	50	30	30	30	30	40	50	40	40	40	20	34
29	20	10	10	20	30	30	30	91	51	30	20	30	20	10	10	51	61	40	51	61	20	30	30	30	33
30	40	30	89	30	20	40	89	50	129	50	10	10	10	10	20	30	30	40	40	50	30	40	40	20	39
Avg	33	35	32	38	42	44	68	72	100	123	101	61	81	54	64	78	59	55	46	48	44	38	38	37	58

Selected Days: Five quiet 2-3-5-8-16 Five disturbed 7-9-18-19-20

N-S TELLURIC CURRENT AMPLITUDE ACTIVITY - MV/KM

Month: May 1965 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg
1	31	31	21	21	21	42	31	21	21	52	135	31	10	10	21	42	21	31	42	31	31	31	42	31	33
2	30	30	30	20	20	20	20	10	20	10	10	10	10	10	10	30	30	30	40	40	40	30	20	30	23
3	30	30	20	20	10	30	20	30	30	20	10	10	10	10	20	10	20	20	20	30	20	20	20	20	20
4	20	20	30	40	40	20	20	10	20	20	50	20	20	20	20	10	20	30	20	30	30	40	30	90	28
5	80	70	70	70	200	270	400	200	300	250	410	150	40	40	50	80	90	80	70	110	80	50	40	50	135
6	50	50	70	60	40	30	70	150	120	40	40	50	139	188	50	50	30	40	40	59	40	30	40	40	63
7	50	59	59	59	50	40	30	30	50	218	278	40	40	20	30	50	20	20	30	30	20	30	30	30	55
8	40	30	40	30	30	30	20	130	90	150	250	180	100	50	50	60	40	60	60	40	50	70	140	160	79
9	100	100	80	60	60	100	50	50	120	120	70	50	88	98	29	29	20	29	29	29	49	39	69	69	64
10	98	127	59	78	69	206	647	343	510	176	637	206	49	20	29	59	29	39	29	29	39	29	20	20	148
11	40	40	40	20	20	20	20	20	91	40	20	20	30	20	20	30	20	20	20	20	20	51	30	30	29
12	20	30	51	61	30	40	51	51	61	51	121	20	10	10	10	0	20	20	20	20	30	20	20	20	33
13	10	10	10	10	20	10	10	20	81	51	71	30	20	10	20	20	20	30	30	20	51	81	81	20	31
14	20	20	30	20	20	30	20	20	20	20	61	30	20	30	20	20	10	20	20	30	40	40	30	30	26
15	51	40	61	30	40	40	20	20	51	101	111	20	20	20	30	20	30	20	40	30	30	40	30	51	39
16	81	40	71	91	101	101	101	182	131	212	576	424	283	576	394	101	61	61	40	61	40	71	71	61	164
17	60	170	90	130	90	60	210	180	100	70	40	30	50	50	50	60	40	30	110	50	50	20	30	50	76
18	40	20	20	30	30	30	20	20	50	20	20	20	20	20	10	20	20	80	30	50	50	30	20	0	28
19	10	20	30	20	30	30	20	59	50	99	20	30	40	20	10	10	20	10	20	20	20	20	20	40	28
20	30	20	10	30	40	30	20	40	50	10	10	10	10	10	20	50	40	50	40	40	50	40	50	40	31
21	0	30	20	70	20	20	10	10	10	10	20	20	50	30	20	20	20	30	30	30	40	50	60	60	28
22	20	20	30	80	60	60	90	50	80	110	100	70	60	130	40	20	30	30	40	30	40	50	30	10	53
23	20	20	20	20	20	29	147	343	88	78	39	29	39	20	20	20	20	20	20	10	10	20	20	20	46
24	29	39	39	39	39	29	29	118	69	20	49	10	10	10	30	20	30	40	30	40	50	20	10	20	34
25	10	10	20	20	20	20	30	20	20	10	20	10	10	51	10	40	20	51	71	40	10	30	30	20	25
26	20	10	30	30	30	30	50	20	10	10	10	0	0	10	30	10	10	20	20	20	50	59	30	59	24
27	40	50	40	40	30	40	30	30	30	40	30	20	10	20	40	20	0	40	40	30	30	40	40	50	33
28	20	40	30	30	30	20	30	20	20	81	91	51	182	71	30	30	30	40	51	51	30	20	30	10	43
29	40	20	40	10	10	30	30	30	10	20	30	30	30	20	20	10	30	20	30	40	30	40	20	20	25
30	20	20	30	30	40	20	20	20	10	20	20	30	30	50	30	20	20	10	20	20	30	30	20	10	24
31	30	40	30	50	40	20	40	30	20	100	100	30	50	30	30	20	20	30	40	30	30	20	20	30	37
Avg	37	41	39	43	42	48	74	73	75	72	111	54	48	54	39	32	27	34	37	36	36	37	37	38	48

Selected Days: Six quiet 2-3-25-26-29-30 Five disturbed 5-8-10-16-17

N-S TELLURIC CURRENT AMPLITUDE ACTIVITY - MV/KM

Month: June 1965 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg
1	20	20	0	10	10	20	20	30	71	81	121	30	30	10	30	30	61	30	71	81	30	40	40	30	38
2	20	10	20	20	20	20	30	30	10	30	30	40	30	70	50	30	30	40	40	60	40	70	70	70	37
3	30	20	30	30	20	10	20	30	50	50	20	20	50	20	30	60	30	50	110	50	110	60	70	30	42
4	20	59	30	79	59	50	69	79	69	79	654	248	69	79	218	208	99	69	89	40	69	69	69	119	112
5	98	49	69	78	108	59	69	29	20	29	10	39	29	29	29	20	29	20	39	59	49	98	39	49	48
6	59	29	39	59	39	39	29	20	49	29	245	167	30	80	100	40	20	30	40	50	40	20	30	30	55
7	40	30	30	20	30	20	20	20	20	20	20	30	71	51	20	20	10	20	20	20	20	20	20	20	25
8	10	20	20	20	10	10	30	40	101	222	172	30	60	280	50	40	30	40	50	50	50	70	70	80	65
9	140	80	60	80	60	140	80	190	170	100	120	160	250	190	260	290	180	230	30	30	50	50	30	20	125
10	20	20	20	20	30	20	10	20	10	20	20	30	50	20	10	10	10	20	30	20	30	40	40	40	23
11	20	20	20	40	20	30	20	20	20	30	30	60	90	40	20	50	40	50	60	60	70	60	30	40	39
12	20	30	20	30	20	40	20	30	50	30	10	20	10	60	40	40	20	30	20	20	20	20	30	30	27
13	30	20	20	20	10	10	10	10	10	60	110	80	20	10	20	10	10	20	20	20	20	50	30	20	27
14	20	30	10	30	30	30	30	20	40	70	90	80	80	40	30	20	20	60	50	60	40	70	50	50	44
15	50	30	30	90	50	50	60	40	30	60	80	250	260	280	420	450	440	220	330	200	140	200	150	160	169
16	220	260	130	110	110	250	220	>730	930	800	740	420	540	>>1060*	>>1060	>>1060	>>1060	>>1060	>>1060	>>1060	660	520	180	160	600
17	170	200	290	150	260	390	190	770	330	450	450	470	500	>1000	410	80	60	500	60	60	50	210	150	150	306
18	220	280	70	70	130	60	50	50	80	120	40	30	20	10	10	30	20	20	90	40	60	90	40	40	70
19	30	100	40	40	40	50	50	50	20	20	30	10*	10	10	10	10	10	19	19	19	19	29	38	29	29
20	38	28	28	19	9	9	9	19	28	47	19	19	9	9	9	9	28	28	19	19	9	9	9	9	18
21	19	19	38	28	28	19	9	9	9	9	9	9	9	19	0	28	19	19	9	19	9	28	9	9	16
22	18	9	18	18	9	9	18	26	26	61	333	262	61	53	18	18	18	18	26	26	18	35	26	26	48
23	30	20	20	20	10	10	10	20	20	10	20	10	30	30	20	30	30	30	30	30	30	20	20	10	21
24	20	20	10	10	20	10	10	0	10	0	20	50	50	30	20	20	40	20	30	20	50	20	20	40	22
25	20	30	20	20	20	60	30	20	10	20	10	20	90	40	70	170	230	160	100	50	70	30	50	90	60
26	119	119	69	79	129	59	59	79	89	79	268	89	30	20	20	20	40	59	69	109	69	109	119	139	85
27	268	208	79	50	50	50	149	79	109	416	218	119	109	129	109	30	40	30	50	50	40	50	59	50	106
28	30	30	30	30	40	30	30	20	10	20	109	50	10	50	20	20	20	20	20	20	30	30	20	20	30
29	30	30	59	79	69	50	79	89	79	486	634	99	139	109	69	69	79	109	89	69	79	50	69	89	117
30	79	79	59	59	79	79	119	109	>890	>594	>822	426	278	317	158	59	69	50	69	109	79	79	89	109	204
Avg	64	63	46	47	51	56	52	89	112	135	182	112	100	138	111	99	93	102	91	84	68	75	56	59	87

*Big disturbance from 1300 UT to 1900 UT June 16th.

Selected Days: Five quiet 10-20-21-23-24 Five disturbed 9-15-16-17-30

TELLURIC CURRENT FLUCTUATIONS - CYCLES PER HOUR

Month: April 1965 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	80	50	30	10	20	0	20	30	10	30	10	0	0	20	30	20	10	20	30	20	30	50	30	60
2	30	20	10	20	20	10	20	20	10	10	10	0	10	0	10	0	0	0	20	30	20	20	50	40
3	60	50	60	30	30	20	20	0	10	10	10	20	0	10	0	10	10	10	10	10	0	30	0	10
4	10	0	20	10	10	10	10	20	80*	70	30	10	0	10	10	90	60	10	10	20	10	10	0	10
5	10	10	10	0	20	0	10	0	10	10	10	10	10	10	10	10	10	10	30	10	10	20	30	10
6	30	10	0	0	10	20	0	10	0	0	10	0	10	10	30	60	40	10	10	40	30	20	20	20
7	20	30	30	10	210*	20	20	20	20	30	70	30	30	10	60	160	70	20	20	10	10	20	10	20
8	10	0	10	0	10	0	10	0	10	50	20	10	10	0	10	20	20	10	10	20	0	20	10	20
9	30	10	20	220*	30	10	40	50	80	10	10	0	10	0	10	0	30	30	30	20	10	30	20	30
10	70*	30	20	30	10	10	10	20	40	90*	130	10	0	0	10	0	0	50	460	50	50	20	0	30
11	10	20	0	10	20	10	10	30	20	20	20	20	40	40	20	30	20	20	40	70	70	40	50	40
12	20	10	20	20	10	20	10	10	20	40	10	30	20	60	30	10	30	10	30	20	50	50	40	50
13	20	40	80*	40	30	40	50	30	40	20	10	10	10	10	20	20	20	20	30	10	60	120*	240*	170*
14	40*	90*	10	0	20	40	30	10	40	50	20	20	0	10	20	20	30	0	20	20	10	10	0	10
15	10	0	10	20	20	20	10	0	20	20	30	20	80	70	20	0	10	30	30	20	10	20	40	50
16	40	20	10	10	10	10	0	10	10	10	20	20	30	20	20	0	10	10	20	10	10	10	0	10
17	0	10	0	10	0	20	10	10	0	10	0	10	10	10	120	260	130	20	10	20	40	30	20	40
18	30	30	150*	340*	120	30	>200	>150	80	140	50	270	140	40	140	330	250	90	70	70	120	60	60	40
19	50	10	40	10	10	10	20	10	20	80	190	70	190	270	250	250	380	180	70	70	50	50	40	50
20	70	80	40	40	60	60	30	20	30	40	60	40	210	280	190	40	30	20	40	60	70	60	50	50
21	40	60	50	10	10	40	20	10	20	0	20	0	20	0	10	10	30	20	30	20	40	20	50	30
22	20	30	50	30	30	10	20	20	30	40	60	10	0	10	20	10	30	30	30	40	60	60	40	20
23	20	30	40	20	60	20	10	20	50	30	10	10	0	20	10	10	20	40	30	40	50	30	100	50
24	60	50	40	40	50	10	10	20	30	20	20	40	60	90	40	30	50	50	30	40	30	0	10	20
25	20	50	60	30	10	20	20	20	20	0	10	10	10	10	10	10	30	20	30	50	70	40	60	120
26	50	40	20	30	30	10	10	10	20	20	40	100	40	30	20	20	10	20	20	30	60	40	50	50
27	140	60	40	40	40	40	10	10	30	10	40	140	90	20	20	20	30	40	40	50	40	30	30	30
28	30	40	30	40	30	30	20	10	30	0	10	10	20	20	10	20	10	30	60	80	50	60	40	60
29	50	40	30	10	50	20	30	30	10	0	10	10	10	0	0	10	10	40	30	50	60	40	30	40
30	30	80	60	60	50	20	50	10	30	20	0	0	10	0	10	20	10	20	30	40	40	30	60	10

*Pearl-type (pc 1) activity.

TELLURIC CURRENT FLUCTUATIONS - CYCLES PER HOUR

Month: May 1965 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	40	30	10	30	10	20	20	10	10	20	40	10	0	0	10	10	10	0	10	10	20	40	40	60
2	80	60	90	50	10	10	10	0	10	0	0	0	0	10	10	10	20	10	20	30	30	40	40	70
3	50	30	80	30	10	10	40	10	20	0	0	10	0	10	10	0	10	10	20	20	20	20	30	20
4	60	40	40	20	20	20	10	0	10	0	30	10	10	0	10	0	20	10	10	10	20	40	40	20
5	40	40	110*	190*	220*	100	60	60	30	60	120	80	20	10	30	50	100	70	80	70	70	80	50	90
6	80	70	50	40	40	20	30	30	50	20	20	20	100	230	80	30	10	40	30	40	50	50	60	70
7	50	50	80	120*	30	30	20	10	20	60	50	30	20	10	20	30	10	10	20	10	20	30	50	60
8	60	60*	100*	40	20	10	10	40	30	60	70	70	40	20	70	50	40	20	20	30	40	50	140*	210*
9	330*	170*	40*	40	90	60	10	20	40	50	20	20	30	100	20	10	10	30	50	60	30	30	70	290*
10	740*	430*	100*	60*	30	30	130*	80	70	30	140	110	50	20	10	20	10	20	40	40	50	40	20	30
11	30	50	50	40	40	40	30	10	10	30	10	10	10	10	0	30	10	20	10	30	40	50	30	30
12	30	230*	230*	60	40	20	20	20	20	30	30	10	0	10	0	0	10	10	20	30	40	40	10	20
13	20	20	10	10	10	10	0	10	30	20	30	10	10	10	10	10	20	20	30	190*	1110*	1190*	1040*	50*
14	30	30	20	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	40	40	60	50	60
15	50	60	50	30	20	20	10	10	20	30	50	10	10	10	10	10	10	10	20	10	20	30	30	20
16	20	20	20	30	40*	30	40	40	20	70	220	70	240	310	220	70	30	40	50	70	30	40	60	60
17	30	80	80	50	50	40	60	40	40	40	30	10	10	30	50	70	20	50	30	50	40	20	20	80
18	60	30	10	30	20	20	10	10	30	10	10	10	0	10	10	0	10	20	30	80	60	20	20	0
19	10	30	60	40	50	30	20	30	30	30	0	10	30	10	0	10	0	0	30	20	10	30	20	20
20	20	10	20	20	30	10	10	20	10	0	10	0	0	10	0	10	10	20	-	-	-	-	-	-
21	0	0	0	10	20	10	10	10	10	0	0	10	20	10	0	0	10	20	10	20	20	20	20	10
22	10	10	10	20	10	10	10	20	10	20	20	10	30	110	30	0	10	10	20	30	20	10	10	10
23	40	20	10	10	10	20	10	30	90*	30	20	10	20	10	20	10	10	10	10	0	10	10	20	20
24	10	20	440*	580*	130*	20	20	70	40	10	0	10	0	10	0	10	0	20	10	20	10	10	10	10
25	20	10	10	10	20	10	20	10	10	0	10	0	0	20	0	10	10	10	10	10	10	30	20	20
26	10	0	10	20	30	20	10	0	10	0	0	0	0	10	10	0	10	10	10	10	10	10	10	10
27	20	30	20	10	20	20	10	10	10	0	10	10	0	10	0	10	0	10	10	40	40	70	30	80
28	50	90	70	40	50	10	30	20	10	10	30	10	100	60	0	10	20	20	20	20	30	20	20	0
29	10	30	40	0	0	10	0	20	0	0	20	10	10	0	10	0	10	20	10	0	20	10	10	10
30	10	10	0	20	10	0	10	0	0	10	0	50*	140*	30	0	0	10	0	10	0	10	10	10	10
31	10	30	10	10	10	10	10	0	10	60*	40*	10	20	10	10	0	10	10	0	10	10	0	10	10

*Pearl-type (pc 1) activity.

TELLURIC CURRENT FLUCTUATIONS - CYCLES PER HOUR

Month: June 1965 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	0	0	0	10	0	0	10	30	30	20	10	0	0	10	10	40	20	30	20	10	50	30	30
2	20	0	10	10	10	0	10	10	0	10	10	10	10	10	10	10	10	10	40	20	30	20	30	20
3	20	10	10	10	10	0	10	20	20	10	10	0	20	10	10	20	10	20	30	20	10	20	20	10
4	0	10	10	20	10	10	10	20	30*	10	170	180	130	20	180	180	50	70	60	30	40	50	50	20
5	30	20	10	30*	80*	20	10	10	0	20	0	10	0	10	10	10	0	10	30	40	30	30	10	40
6	40	30	30	20	10	20	10	10	10	20	70*	50	10	50	90	10	10	30	20	20	20	10	20	20
7	10	10	10	10	10	10	0	10	10	0	10	10	20	10	10	0	10	0	10	0	20	20	10	10
8	10	0	10	0	10	0	0	10	40	30	70	10	10	200	90	20	0	40	30	30	20	30	20	40
9	40*	20	80*	240*	40*	120*	30	20	30	30	40	30	100	260	300	260	260	150	20	10	30	40	20	10
10	0	10	10	0	20	0	0	0	0	10	0	10	10	10	0	0	10	10	20	10	30	20	20	30
11	20	20	10	10	10	20	0	20	10	10	20	40	70	10	10	10	10	0	10	20	20	20	0	30
12	20	20	10	10	10	10	10	10	10	10	0	10	0	20	10	10	20	0	10	0	10	20	0	10
13	20	20	10	0	0	0	0	10	0	20	30	10	0	10	0	0	0	10	0	0	10	10	10	20
14	10	10	0	0	10	10	10	0	10	10	30	40	20	10	0	10	0	10	10	10	20	20	0	20
15	10	10	10	20	10	20	20	10	20	10	20	30	90	90	100	160	170	170	160	120	70	40	40	60*
16	240*	250*	60*	120*	50*	50	50	>180	130	80	110	180	190	>>320	160	310	290	390	370	380	370	380	110	40
17	90	90	40*	50	70	50	130	80	100	50	50	140	200	290	200	30	100	300	40	20	30	30	40	150
18	110	90*	30	30	30	30	20	10	40	20	0	10	10	0	0	10	0	10	10	10	20	40*	10	0
19	20	30	40	30	30	30	10	10	10	0	10	0	0	0	0	0	10	0	20	10	20	30	30	40
20	30	30	20	10	10	0	0	10	10	10	10	10	0	0	0	0	10	0	0	10	10	0	10	20
21	10	20	20	30	20	10	10	10	0	0	0	10	0	0	0	20*	0	10	0	0	0	10	0	0
22	0	10	0	0	0	10	0	10	0	20	40	30	20	20	10	10	0	10	270*	800*	100*	870*	120*	10
23	10	10	0	10	0	0	10	0	10	10	0	0	10	20	0	10	20	0	10	10	0	20	10	10
24	0	10	10	0	0	10	0	0	0	0	10	10	10	10	0	0	10	0	10	10	10	10	0	20
25	10	20	10	20	10	0	10	0	0	10	0	0	10	20	10	60	200	100	90	90	60	20	20	50
26	50	40	30	90*	190*	40*	10	20	30	30	50	10	10	0	10	10	30	20	50	50	40	50	80	100
27	70	70	30	50	30	10	20	20	20	100	40	40	100	190	140	10	10	30	20	40	50	40	40	40
28	30	40	30	20	100	30	10	0	0	0	30	20	0	20	0	10	0	0	0	0	10	10	30	30
29	50*	60*	30	30	30	10	10*	30	20	70	170	60	60	50	90	120	110	80	40	90	80	40	110	100
30	100	110	70	40	30	50*	80*	40	80	80	250	300	260	240	200	60	30	50	40	90	50	50	80	60

*Pearl-type (pc 1) activity.

TELLURIC MICROPULSATION ACTIVITY - pc 1

R. R. Heacock
Assistant Geophysicist

Instrumentation. The sensing elements are 200 meter spaced telluric current electrodes aligned north-south geographically. The recording system consists of a low pass LC 60 cps rejection filter, a 50k voltage divider gain control, a Tektronix type 122 preamplifier (X1000, h.f. cutoff 50 cps, l.f. cutoff 0.8 cps), a second 60 cps rejection filter, a Kronhite electronic band-pass filter with h.f. cutoff at 2 cps and l.f. cutoff at 0.02 cps, and an Esterline-Angus 1 ma recorder operating at a chart speed of 3/4" per min. Time mark signals furnished by the Institute operated NASA Minitrack station are accurate to a millisecond.

The instrumentation has a rather flat response peak from 1 through 5 sec period, essentially the period range of pearl-type micropulsations at College. Micropulsations are also being recorded continuously on tape, and the taped record has been inspected for evidence of pearl-type events at frequencies higher than 2 cps, with none being found to date.

Scaling procedures. The charts are inspected for half-hourly occurrences of pearl-type micropulsations. The criteria used for identification of pearls are a) a rather smooth "pearl"-like envelope, b) a rather constant pulse period in the range 0.5-6 secs, and c) a non-impulsive character (i.e. a small dynamic range). In addition, the events are inspected for repeating patterns in the pearls, and the repetition period is listed along with the average pulse period and the peak-to-peak amplitude of the pearl envelope.

Sonagrams are made of the more prominent pearl events, and the repetition periods of pearl patterns are checked against the repetition periods in the structure as seen on the sonagram, insuring a good accuracy in this scaling. Pulse periods scaled from the charts are also checked against the pulse periods shown on the frequency scale of the sonagrams.

Amplitudes are measured peak-to-peak for the envelope (not including isolated pulses or spikes) at the time of largest amplitudes in the half-hour interval.

There is an uncertain dividing line between pearl-type micropulsations and the more irregular disturbance-type (pi 1) micropulsations. However, the uncertain cases included in the following scalings tend to have longer pulse periods ($T > 3$ secs), tend to occur in the late afternoon or evening (2-8 U.T.), tend to occur only when $Kp > 2$, and are unstructured. Thus, the reader may delete occurrences for which all these conditions are met, if he desires.

Occasionally, micropulsation events are seen which have the rather narrow frequency range characteristic of pearl events, but which are impulsive in character, i.e. a typical event has a large dynamic range in the first few minutes after onset. These events tend to lie in the lower part of the frequency range of pearls, 0.2-0.5 cps, and they tend to be seen only in local afternoon hours when magnetic activity is in progress, Kp >2. It is not clear whether these events are type pc 1 or type pi 1. They are indicated by "I" in the column headed "Pattern Spacing." This indication was initiated with the July 1964 data.

This micropulsation recording and analysis program is supported by the Air Force Cambridge Research Laboratories, Office of Aerospace Research, under contract No. AF 19(628)-1695, monitored by Mr. Elwood Maple.

TYPE pc1(pearl) MICROPULSATIONS ACTIVITY
College N-S Telluric Currents

April 1965

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
1	2230	1.7		2	11	1530	3.3		2
2	0030	1.7		2	11	1530	1.7		2
2	0200	1.5		2	12	0100	3.6		2
2	1630	1.4		1	12	1230	2.4		2
4	0030	3.3	4.0	2	13	0100	3.4		2
4	0100	3.2	4.0	2	13	0200	3.6		6
4	0430	3.1		2	13	0230	3.6		2
4	0500	3.3		2	13	1900	3.4		2
4	0830	1.8		7	13	1930	3.3		2
4	0900	1.8		4	13	2000	3.6		2
4	0930	2.0		2	13	2030	3.4		3
4	1500	3.2		3	13	2100	3.3		6
5	0000	3.2	4.0	2	13	2130	3.3		8
5	0030	3.3	4.0	2	13	2200	3.3		9
5	0430	3.3		2	13	2230	3.3		15
6	1900	3.6		2	13	2300	2.9		10
7	0000	4.0		3	13	2330	3.1		12
7	0100	3.7		4	14	0000	3.2		4
7	0130	3.6		4	14	0030	3.1	4.2	5
7	0200	2.9		2	14	0100	3.1	4.2	12
7	0230	3.4		4	14	0130	3.6		3
7	0400	3.3		8	14	0200	4.8		3
7	0430	3.1		10	14	0500	2.9		2
7	2230	1.3		2	14	2130	3.8		2
8	0000	3.1		2	14	2200	3.6		2
8	1000	3.1		2	14	2230	3.6		2
9	0200	4.5		2	14	2300	3.4		2
9	0230	3.6		2	15	0500	2.9		6
9	0300	3.3	I	12	15	0530	2.9		4
9	0330	2.9	I	8	15	1630	4.0		1
9	0400	2.7		4	16	0430	4.2		2
9	0430	2.8		2	17	0300	4.3		2
9	0700	2.3		2	17	0330	4.3		2
9	1600	2.6		2	17	1700	4.8		4
9	2000	3.3		2	18	0200	5.0		6
9	2030	3.1		2	18	0230	3.1		8
9	2100	3.2		2	18	0300	2.5		18
9	2130	3.1		2	18	0330	5.0	I	30
9	2200	3.3		2	19	0200	2.2		2
9	2230	3.3		2	19	1030	1.1		2
10	0030	3.2	3.5	5	19	1100	0.9	2.0	2
10	0100	3.3		2	19	1830	4.2		3
10	0130	2.8		3	20	0330	1.5		2
10	0400	2.8		2	20	0430	5.0	4.2	3
10	0430	2.9		2	20	0530	1.6	1.6	2
10	0900	1.5		8	20	1100	1.0	1.5	4
10	0930	1.5		2	20	1130	1.0	1.5	3
11	1430	2.2		2	20	1200	1.3		3
11	1500	1.8		2	20	2300	3.1		2

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				April 1965					
21	0130	2.9		2	23	2300	2.2		6
21	0200	2.9		4	23	2330	2.1		4
21	0230	2.7		3	24	0000	2.8		2
21	0300	2.5		3	24	0030	2.9	4.0	2
21	2230	1.0		2	24	0100	2.9		2
21	2330	1.6	3.2	2	24	0130	2.9		2
22	0000	1.7		2	24	1800	1.4	2.3	2
22	0030	1.5	1.9	6	24	1830	1.4	2.3	2
22	0100	1.5	1.9	5	24	1900	1.4	2.3	2
22	0430	1.4		2	25	2200	3.3		2
22	0500	1.4		2	25	2230	3.3		2
22	1000	1.4	1.5	1	25	2300	3.3		2
22	1300	1.0	1.7	2	25	2330	3.1		2
22	1330	1.0	1.7	2	26	0000	3.3		2
22	1400			2	26	0100	1.7	2.8	2
22	1430	1.4	2.1	3	26	0130	1.8	2.8	2
22	1500	1.3	2.1	2	26	0200	1.8	2.8	2
22	1530	1.4	1.9	1	26	0930	3.3		2
23	0030	2.0		2	26	1900	1.6	2.7	3
23	0100	2.0	2.1	3	26	1930	1.7	2.7	2
23	0130	2.5	3.1	3	27	1100	1.0	2.3	4
23	0200	2.8	3.3	3	28	0700	1.6		1
23	0230	2.9		2	28	0800	1.7		2
23	2200	1.6	3.2	2	29	0730	2.2		2
23	2230	1.6		3	30	0130	2.9		2
					30	0200	3.1		2
				May 1965					
4	1100	3.5		2	7	0330	2.5	3.5	13
4	1330	2.9		2	7	0400	3.3		4
4	2300	3.5	7.0	7	7	0430	3.3		2
4	2330	3.1	7.0	3	8	0100	3.1	3.0	9
5	0130	3.4		3	8	0130	2.8	2.9	4
5	0200	3.4		6	8	0200	3.1		8
5	0230	4.0		20	8	0230	3.3		5
5	0300	4.3		18	8	1400	3.4		3
5	0330	3.8		18	8	2200	5.0		8
5	0400	2.6	I	5	8	2230	4.2		17
6	0230	3.3		2	8	2230	2.2		32
6	0300	3.4		2	8	2300	3.8		28
6	1100	2.9		3	8	2330	3.1		8
6	1200	3.3		4	9	0000	3.3		14
6	2330	3.6		3	9	0030	4.0		25
7	0100	3.1		4	9	0100	3.8		55
7	0130	2.9		4	9	0130	3.6		12
7	0200	2.9		2	9	0200	4.3		11
7	0230	3.6		2	9	1230	3.3		3
7	0300	2.6		4	9	2300	3.3		4

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				May 1965					
9	2330	3.3	3.4	12	15	1330	1.8	3.1	2
10	0000	3.4	3.7	70	15	1400	1.5	3.1	2
10	0030	3.3		22	15	1930	1.8	4.0	4
10	0100	3.3		20	15	2000	1.9	4.0	3
10	0130	3.2		20	15	2130	2.2	4.3	3
10	0230	4.8		18	16	0400	4.3	3.6	7
10	0300	3.8	3.8	6	16	0430	3.6		4
10	0330	3.1	3.8	3	16	0500	3.7		5
10	0600	2.4	I	18	16	0600	4.0		6
10	0630	1.7		2	16	0630	2.9		4
10	0730	3.1		3	16	0700	2.5		4
11	1230	2.2		2	16	2200	3.4		6
11	2000	3.3		2	16	2330	2.0		2
11	2030	2.2		2	17	0000	2.0		2
11	2100	2.2		3	17	0030	2.0		4
11	2130	3.3		2	17	0100	2.0		4
11	2200	3.2		2	17	0200	4.0		4
11	2230	3.6		2	18	0000	1.7		2
11	2300	2.9		2	18	0030	3.4		2
11	2330	3.1		2	18	0300	3.3		3
12	0000	3.3		2	18	0330	3.1		3
12	0030	3.8		3	18	0400	3.6		7
12	0100	3.8		8	19	0400	4.8		4
12	0130	3.6	3.8	17	19	0600	3.7		2
12	0200	3.6		18	20	0730	2.9		2
12	0230	3.6		6	20	0800	2.9		2
12	0300	4.0		6	20	1700	1.2	1.5	5
13	1930	2.5		24	20	2030	2.9		2
13	2000	3.0	3.7	36	22	0230	5.0		4
13	2030	2.7	3.7	60	22	0330	3.3		2
13	2100	2.9	3.7	56	22	0400	3.1		4
13	2130	2.9	3.7	50	22	0630	5.0		6
13	2200	3.0	3.7	64	22	1630	1.5	2.0	3
13	2230	3.1	3.7	50	22	1700	1.7	2.0	4
13	2300	2.9		12	22	1730	1.7	2.0	2
13	2330	2.9		2	22	1800	1.7	2.5	2
14	0030	4.3		3	22	1900	1.9	2.9	2
14	0100	4.0		3	22	1930	1.9	2.9	3
14	0130	2.9		2	22	2000	2.0	2.9	2
14	0200	2.9		2	23	0300	4.5		3
14	1100	3.3		2	23	0330	4.0		4
14	1200	3.4		2	23	0730	2.9		3
14	2200	2.0		2	23	0800	3.0		9
14	2230	2.2	3.5	2	23	1900	1.7	2.5	3
14	2300	2.1		2	23	1930	1.8	2.5	2
14	2330	1.7		2	23	2130	1.7	2.0	1
15	0100	2.1		2	24	0030	4.2		3
15	1230	1.7	3.2	2	24	0130	4.0		4

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				May 1965					
24	0200	4.5	4.3	28	26	2230	3.3		2
24	0230	4.3	4.3	35	27	0030	3.3		2
24	0300	4.2	4.3	34	27	2130	3.0	4.9	2
24	0330	4.2		30	27	2230	3.1		2
24	0400	4.3		22	27	2300	3.3	4.3	2
24	0430	4.2		6	27	2330	3.6	4.3	5
24	0500	5.3		4	28	0000	3.6	4.3	4
24	0600	5.3	4.6	4	28	0030	3.1		2
25	2200	4.0		3	29	2030	4.5	7.0	3
25	2230	4.0	5.0	3	29	2200	4.0		3
25	2300	3.6	5.0	2	30	1030	5.7		4
25	2330	3.6	5.0	2	30	1100	4.8	7.0	11
26	0230	3.6		2	30	1130	4.0	7.0	18
26	1400	4.8		4	30	1200	3.4	7.0	15
26	2000	2.6	5.0	10	30	1230	2.9		15
26	2030	3.0	5.0	4	30	1300	2.7		14
26	2100	4.0		3	30	1330	2.6		3
26	2130	3.6	5.5	4	31	0930	3.1		11
26	2200	3.3		2	31	1000	2.4		10
					31	1200	3.3		2
				June 1965					
1	1400	5.0		4	8	1930	5.4		2
3	0700	3.3		3	8	2130	2.9		2
3	0730	3.6		7	8	2200	2.9		2
3	1130	2.9		3	8	2300	4.5		5
3	2130	5.0		4	8	2330	2.5	I	3
3	2200	5.0		4	9	0000	2.7		7
3	2230	4.5		3	9	0030	4.5		5
4	0000	5.0	7.0	6	9	0130	4.2		3
4	0030	5.3		4	9	0200	4.8		10
4	0530	1.8	2.3	2	9	0230	4.2		15
4	0600	1.8		2	9	0300	4.8		27
4	0730	4.2		7	9	0330	3.8		7
4	0800	4.3		6	9	0400	4.3		9
4	0830	4.5		12	9	0430	4.5		9
4	0900	5.0		6	9	0500	4.5		27
5	0000	3.3		2	9	2000	4.0		3
5	0330	4.0		8	9	2100	4.0		4
5	0400	3.3		20	9	2130	3.4		2
5	2300	2.0		2	9	2330	3.8		2
6	0400	5.0		4	10	0000	3.6		2
6	0430	3.8		2	10	0030	3.7		2
6	0500	3.6		3	10	0100	3.3		3
6	0530	3.6		2	10	0200	2.2		2
6	1030	3.3	I	31	10	0730	2.9	3.5	3
8	1600	4.5		2	10	0800	3.1	3.5	3

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				June 1965					
10	0830	3.1		2	15	2300	4.5		6
10	0900	2.9		2	15	2330	4.0		8
10	0930	2.9	3.3	2	16	0000	3.4		10
10	1000	2.5	3.0	2	16	0030	4.8	I	60
10	1030	2.5	3.0	2	16	0100	2.9	I	52
10	1100	2.5	3.0	2	16	0130	1.7		4
10	1130	2.5	3.0	2	16	0230	1.8		2
10	1200	3.3		2	16	0230	3.3		6
10	1230	3.6		2	16	0300	4.5		45
10	1930	4.0		3	16	0330	5.0		12
10	2000	4.2		3	16	0400	4.8		7
10	2030	4.0		3	17	0200	5.0	I	20
10	2100	4.0		3	17	0230	5.3		5
10	2130	4.0		3	17	0300	3.4		6
10	2200	4.2	6.0	3	17	0330	3.8		2
10	2230	4.0		3	17	2130	1.7		6
10	2300	4.0		3	17	2200	1.4		3
10	2330	4.2		3	17	2230	1.3		4
11	0000	4.3		3	17	2300	1.5		5
11	0100	4.3	5.4	3	18	0100	4.0		10
11	0130	4.2	5.4	3	18	0130	1.4	1.6	5
11	0600	4.3		3	18	0200	1.5	1.6	3
11	0800	3.3	4.1	1	18	0230	3.8		6
11	1200	2.5	3.7	4	18	0300	4.2		4
11	1230	2.5	3.7	3	18	0330	4.0		4
11	1300	2.0	3.4	3	18	0400	3.2		4
11	1330	2.0	3.5	3	18	0430	5.0		8
11	1400	2.1	3.7	4	18	1000	1.5	1.6	2
11	1430	2.0	3.7	2	18	1030	1.5	1.6	2
11	1500	2.0		2	18	1100	1.5	1.6	2
12	0730	6.2		5	18	1530	1.5	1.6	1
12	0830	4.5		3	18	1800	0.9		2
12	0900	3.3		2	18	1830	0.9		3
13	0300	4.0		3	18	1900	1.1	1.5	3
13	0330	4.0		3	18	1930	1.1	1.5	4
13	0400	4.2		3	18	2000	1.1	1.3	6
14	0130	4.0		3	18	2030	0.9	1.5	6
14	0200	4.0		3	18	2100	0.7	1.0	10
14	0230	4.0		3	18	2100	3.4		3
14	0330	3.4		2	18	2130	1.0		10
14	0400	5.0		4	19	0030	3.7		5
14	0930	3.1		4	19	0100	3.7		2
14	1000	3.3		3	19	2200	4.0		3
15	0230	4.8		4	19	2230	4.0		3
15	0330	4.8		5	19	2300	3.8		2
15	0430	6.2		5	20	0500	2.0	2.0	2
15	0500	5.0		10	20	0530	2.0	2.0	2
15	0530	5.0		10	20	0600	1.9	2.0	2
15	0630	3.3		2	20	1600	3.1	4.6	2

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				June 1965					
20	1630	3.2	4.6	2	24	1930	3.3		2
20	1930	4.3	4.6	3	24	2000	3.3		2
20	2000	4.2	4.6	3	24	2330	1.4	2.1	4
20	2130	4.8		4	25	0000	1.5	2.3	2
20	2200	3.3	3.6	2	25	0900	1.5	2.5	2
20	2200	5.0	5.5	2	25	0930	1.7	2.5	2
20	2230	3.4	3.6	2	25	2200	4.0		3
21	0800	1.3	1.6	2	25	2230	3.6		2
21	0830	1.3	1.6	2	25	2300	3.4		2
21	0900	1.8	2.1	4	26	0000	4.0		3
21	0930	1.6	1.7	2	26	0030	3.4		3
21	1500	1.4	2.7	6	26	0100	3.2		3
21	1530	1.3	2.7	7	26	0130	3.1		3
21	1600	1.3	2.7	4	26	0200	5.0		4
21	1730	2.2		2	26	0230	4.2		4
21	1800	2.4	3.3	4	26	0300	4.2		9
21	1900	3.3	5.0	3	26	0330	5.0		22
21	1930	4.0		6	26	0400	4.5		20
21	2000	3.8		5	26	0430	3.6		5
21	2030	4.2		12	26	0430	2.5		16
21	2100	3.8		3	26	0500	2.7	I	22
21	2130	3.6		4	26	1230	1.3	1.5	2
21	2200	3.6	4.3	3	26	1300	1.4	1.6	3
21	2230	3.6	4.3	4	26	1330	1.5	1.6	2
21	2300	3.8		3	26	2030	1.4	1.9	4
21	2330	4.2		3	26	2100	1.4	1.9	5
22	0000	4.0	2.5	3	26	2130	1.7	1.9	2
22	1830	1.6	2.5	20	26	2200	1.1	2.2	3
22	1900	1.6	2.6	22	26	2230	1.2	2.2	3
22	1930	1.7	3.0	25	29	0030	2.2	2.5	6
22	2000	1.8	3.0	7	29	0100	2.2	2.5	7
22	2030	1.8		3	29	0130	2.6	2.8	6
22	2100	1.8		15	29	0230	2.2		4
22	2130	1.8		25	29	0300	2.0	2.5	8
22	2200	1.8	2.8	5	29	0330	2.0		7
23	0100	4.2		3	29	0400	2.3		5
23	0130	4.2		3	29	0430	2.1		4
23	2130	3.8		2	29	0500	2.5		2
23	2200	3.7	4.0	3	29	0700	3.3	I	5
23	2230	3.7	4.0	3	30	0400	5.7	I	5
24	0200	3.6		2	30	0500	6.2	I	8
24	0230	3.6		2	30	0530	4.0	I	10
24	0600	4.8		4	30	0600	4.0	I	24
24	1130	4.0		4	30	0630	3.1	I	3
24	1200	3.8		3	30	0700	2.2	I	2
24	1630	3.2		2	30	2300	2.0		2
24	1700	3.3		2	30	2330	2.9		3

GEOMAGNETIC ACTIVITY, K, A_k, C

J. B. Townshend, Observer in Charge
College Magnetic Observatory, USC & GS

The K, A_k and C-indices for College are assigned at the Coast & Geodetic Survey's College Magnetic & Seismological Observatory located at the University of Alaska.

The K-index. The K-index is an indication of the intensity of the solar particle-radiation effects for each eight intervals beginning 00-03, 03-06...21 to 24 U.T. It is defined as, the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval, according to the season, the sunspot cycle, and the phase of the moon. The K-indices are scaled from the Normal and Storm magnetograms, D and H traces and are based on the most disturbed component. The Z component is no longer used for determining K. The schedule for K-indices vs gamma range for College is as follows:

Gamma Range	K-index
0 < 25	0
25 < 50	1
50 < 100	2
100 < 200	3
200 < 350	4
350 < 600	5
600 < 1000	6
1000 < 1650	7
1650 < 2500	8
2500 +	9

The Equivalent Daily Amplitude, A_k. The K-index is converted into an equivalent range, a_k which is near the center of the limiting gamma ranges for a given grade of K. The average of the eight values a_k is called the equivalent daily amplitude A_k. For College the equivalent a_k for K is:

K =	0	1	2	3	4	5	6	7	8	9	
a_k =	0	3	7	15	27	48	80	140	240	400	(10γ)

The unit 10γ has been chosen so as not to give the illusion of an accuracy not justified. The table for the re-conversion of K into an equivalent amplitude a_k is conventional and differs somewhat from the values adopted for the center of the limiting gamma ranges. The difference is of importance only in special studies, therefore, the conventional re-conversion of K into a_k is used.

The Magnetic Daily Character-Figure C. To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1; if it is normal or moderately disturbed; C=2, if it is greatly disturbed. The method used to assign characters at the College Observatory is based on A_k as follows:

A_k range	C
0 < 11	0
11 < 50	1
50 +	2

Reference: Annals of the IGY, IV, pp. 227-236, 1957.

MAGNETIC ACTIVITY

April 1965

K-indices, Whole-day Character, C, and Equivalent Daily Amplitude, A_k

Observatory, College Magnetic Observatory, U S C & G S.

	K-indices										
	Hours UT										
Date	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	Sum	C	A_k
1	1	0	1	1	1	1	0	0	05	0	02
2	1	1	1	1	0	0	0	1	05	0	02
3	0	0	0	0	0	0	0	0	00	0	00
4	0	0	4	3	1	3	0	0	11	0	08
5	0	1	0	1	0	0	0	0	02	0	01
6	0	1	0	0	3	2	0	1	07	0	04
7	1	3	1	3	3	4	0	0	15	1	10
8	0	0	1	2	0	1	0	1	05	0	02
9	2	3	3	2	0	1	0	1	12	0	06
10	2	1	3	4	0	0	0	0	10	0	07
11	0	0	0	2	1	2	3	2	10	0	05
12	1	1	0	1	3	0	1	1	08	0	04
13	1	2	2	1	0	0	1	0	07	0	03
14	1	0	1	1	1	2	0	0	06	0	02
15	0	1	2	2	3	1	1	0	10	0	05
16	0	1	1	1	1	0	0	0	04	0	02
17	0	0	0	0	4	4	2	1	11	0	08
18	3	5	9	6	6	5	3	2	39	2	87
19	2	1	1	5	4	6	2	2	23	1	23
20	2	2	2	4	6	1	1	1	19	1	17
21	2	0	0	0	0	2	1	1	06	0	03
22	1	1	1	2	0	0	1	2	08	0	03
23	0	1	2	2	0	1	1	2	09	0	04
24	1	2	0	3	2	0	1	0	09	0	04
25	0	1	0	0	0	1	1	1	04	0	02
26	1	0	1	4	1	1	1	1	10	0	06
27	1	1	1	3	1	0	0	0	07	0	03
28	0	0	1	0	1	0	0	0	02	0	01
29	0	0	2	0	0	1	2	0	05	0	02
30	2	1	2	1	0	0	1	1	08	0	03

	D	H
Lower limit for K = 9	2530	2490

MAGNETIC ACTIVITY

May 1965

K-indices, Whole-day Character, C, and Equivalent Daily Amplitude, A_k

Observatory, College Magnetic Observatory, U S C & G S.

	K-indices										
	Hours UT										
Date	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	Sum	C	A_k
1	1	0	0	2	0	0	1	1	05	0	02
2	1	0	0	0	0	0	0	0	01	0	00
3	0	0	1	0	0	0	0	0	01	0	00
4	0	1	0	0	0	0	1	1	03	0	01
5	2	4	5	5	2	3	1	1	23	1	20
6	1	1	3	1	4	1	1	1	13	0	08
7	2	2	1	3	1	0	1	0	10	0	05
8	1	1	2	3	2	2	2	3	16	1	08
9	3	3	2	2	3	0	1	1	15	1	08
10	2	3	5	4	2	1	0	0	17	1	13
11	0	0	0	0	0	0	0	1	01	0	00
12	2	2	2	2	0	0	0	0	08	0	04
13	0	0	1	1	0	0	0	1	03	0	01
14	1	1	0	0	0	0	1	1	04	0	02
15	1	1	1	2	0	1	0	1	07	0	03
16	1	3	3	5	6	2	1	2	23	1	22
17	2	2	3	1	2	2	2	0	14	0	07
18	1	2	1	1	1	2	1	1	10	0	04
19	1	1	0	1	0	0	0	0	03	0	01
20	0	1	0	0	0	1	1	0	03	0	01
21	1	2	0	0	0	0	1	1	05	0	02
22	1	2	2	2	3	1	1	1	13	0	06
23	1	1	3	3	1	0	0	1	10	0	05
24	2	2	3	1	0	1	1	0	10	0	05
25	0	0	0	0	0	1	1	0	02	0	01
26	1	1	1	0	0	0	1	1	05	0	02
27	2	2	1	1	0	1	1	1	09	0	04
28	0	0	0	2	3	1	1	1	08	0	04
29	1	1	0	0	0	1	0	0	03	0	01
30	1	1	1	0	1	0	0	0	04	0	02
31	1	2	1	2	2	0	0	1	09	0	04

	D	H
Lower limit for K = 9	2530	2490

MAGNETIC ACTIVITY

June 1965

K-indices, Whole-day Character, C, and Equivalent Daily Amplitude, A_k

Observatory, College Magnetic Observatory, USC & GS.

	K-indices										
	Hours UT										
Date	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	Sum	C	A_k
1	1	1	2	2	0	1	1	1	09	0	04
2	1	1	0	1	2	1	1	2	09	0	04
3	1	1	1	0	1	2	2	1	09	0	04
4	1	2	2	6	5	4	2	2	24	1	23
5	2	3	2	0	0	0	1	0	08	0	04
6	2	2	0	4	2	1	1	0	12	0	07
7	2	1	0	0	1	0	0	0	04	0	02
8	0	1	2	4	4	1	2	3	17	1	11
9	3	3	3	3	5	5	1	1	24	1	20
10	0	1	0	0	0	0	0	0	01	0	00
11	0	1	1	1	1	1	2	2	09	0	04
12	0	2	1	0	1	1	0	0	05	0	02
13	0	0	0	1	0	0	0	0	01	0	00
14	0	2	1	3	2	1	2	2	13	0	06
15	2	2	2	3	4	5	4	3	25	1	19
16	5	4	6	6	8	8	7	5	49	2	113
17	4	4	5	6	6	5	2	3	35	1	42
18	3	3	2	2	0	1	2	1	14	0	07
19	1	1	1	0	0	0	0	0	03	0	01
20	0	0	0	0	0	0	0	0	00	0	00
21	0	0	0	0	0	0	0	0	00	0	00
22	1	1	1	3	2	1	0	1	10	0	05
23	1	1	1	0	0	0	0	0	03	0	01
24	0	1	0	0	0	1	1	1	04	0	02
25	0	2	0	0	2	5	2	2	13	1	10
26	3	3	2	3	0	0	2	2	15	0	08
27	3	2	2	5	3	1	0	1	17	1	12
28	1	2	0	2	0	0	0	0	05	0	02
29	2	3	3	5	3	2	2	1	21	1	15
30	2	3	5	6	5	2	2	2	27	1	27

	D	H
Lower limit for K = 9	2530	2490